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# AMERICAN BEE JOURNAL

JULY, 1916



Results of White Clover in the Apiary of E. L. Hofman, at Janesville, Minnesota

**BETTER FRUIT PUBLISHING COMPANY**  
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# American Bee Journal

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Hinged cover on the two larger sizes postage extra.

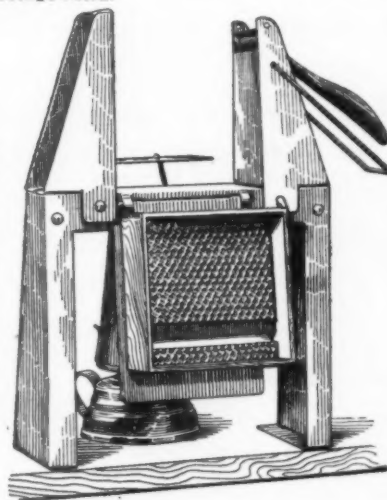
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# American Bee Journal

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	1	6	12
Untested.....	\$1.50	\$ 7.50	\$12.00
Tested.....	2.00	10.50	18.00
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1-frame nucleus.....	\$2.00	5-frame nuclei.....	\$ 5.00
2-frame nuclei.....	3.00	8-frame colony.....	8.50
3-frame nuclei.....	4.00	10-frame colony.....	10.00

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With honey nice and thick.

They have won a world-wide reputation for honey gathering, hardiness, gentleness, etc.

Untested queens, 1, \$1.00; 6, \$5.00; 12, \$9.00

Select untested, 1, \$1.25; 6, \$6.00; 12, \$11.00

Safe arrival and satisfaction guaranteed. Circular free.

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**The Root Strain of Bees have Shown  
Themselves to be Highly Resistant**

While we do not claim their introduction will alone cure European Foulbrood, or that it will not make a start in their colonies, we have reports of where they have, with a little help, fought themselves nearly clean of European Foulbrood which was all around them in black and hybrid colonies.

These queens will be ready for delivery about June 1. Orders will be filled in rotation. Later in the season we will make delivery promptly.

**PRICES.**—Our regular price is \$1.50 in June and \$1.00 after July 1 for untested queens; but we will club them with Gleanings in Bee Culture for one year and a queen for \$1.50, provided we can fill orders for queens when we have a surplus of them. This will probably be July and August.

**The A. I. ROOT COMPANY**

**Medina, Ohio**

# American Bee Journal

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43 Years' Experience in Queen Rearing—Breed 3-Band Italians Only

	Nov. 1 to May 1			May 1 to June 1			June 1 to July 1			July 1 to Nov. 1		
	1	6	12	1	6	12	1	6	12	1	6	12
Untested .....	\$1.50	\$7.50	\$13.50	\$1.25	\$6.50	\$11.50	\$1.00	\$5.00	\$9.00	\$.75	\$4.00	\$.75
Select Untested .	2.00	8.50	15.50	1.50	7.50	13.50	1.25	6.50	12.00	1.00	5.00	9.00
Tested .....	2.50	13.50	25.00	2.00	10.50	18.00	1.75	9.00	17.00	1.50	8.00	15.00
Select Tested ....	3.00	16.50	30.00	2.75	15.00	27.00	2.50	13.50	25.00	2.00	10.00	18.00

Bees by the pound 1 lb., \$1.25; 2 lb., \$2.25; 3 lb., \$2.75.  
Nuclei (no queen) 1 fr., \$1.50; 2 fr., \$2.15; 3 fr., \$2.75; 4 fr., \$3.50; pure 3-band Italians.  
Select queen wanted, add price.

Capacity of yard, 5000 queens a year—Select queen for breeding, \$5.00  
The very best queen for breeding, \$10.

Queens for export carefully packed in long distance cages, but safe delivery not guaranteed

LONGMONT, COLO., June 2, 1916

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A. J. MCCARTY.

**JOHN M. DAVIS, SPRING HILL, TENN.**

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**AMERICAN BEE JOURNAL, Hamilton, Ill.**

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Ft. Deposit, Alabama

## TESTED QUEENS BY RETURN MAIL

\$1.00 each

These Queens are not culls or inferior in any way because they are cheap. They were reared last September and October, and wintered in 4-frame nuclei, expressly for our early trade in tested queens. We guarantee every queen to be good as the best. No disease in our apiary.

Untested queens early in April, \$1.00 for single queen; \$9.00 per dozen.

**J. W. K. SHAW & COMPANY**  
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Choice Home Bred

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One untested queen, \$.50  
One tested queen, 1.30  
One sel. tested queen 1.60  
One breeder, 2.50  
One comb nucleus, no queen, .90  
½ pound bees, .90  
One pound bees, 1.50

Safe arrival guaranteed. Send for free catalog

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## HONEY AND BEESWAX

CHICAGO, June 17.—There is very little movement in honey, either extracted or comb. The stocks of both are ample for all demands, prices remain about as recently quoted, there being no large sales to quote from.  
R. A. BURNETT & CO.

KANSAS CITY, MO., June 17.—The honey market remains about the same. There is very little old honey left on this market. We believe that the new honey—when it comes in—will sell at around \$3.50 to \$3.75 per case. Extracted honey is cleaning up very rapidly, and while prices are no higher, there is a considerably firmer feeling to the market. Prices range from 6c a pound for dark amber to 7c a pound for lighter honey. There is no white extracted on this market.

C. C. CLEMONS PRODUCE COMPANY.

DENVER, Colo., June 17.—We have nothing to offer in comb honey at the present time. We are selling extracted honey in a jobbing way as follows: White, 8½¢ per pound; light amber, 8¢ per pound, and amber, 7¢ per pound. We pay 26¢ per pound in cash and 28¢ per pound in trade for clean, average yellow beeswax delivered here.

THE COLO. HONEY PRODUCERS' ASS'N  
F. Rauchfuss, Mgr.

SAN ANTONIO, June 15.—The demand is good for bulk comb honey, but little trade for extracted. The south Texas crop is larger than normal, and of very good quality. Prices have had a tendency to shrink under the heavy offerings. Wholesale prices on bulk comb honey is steady at 6c basis, extracted according to quality at 6½¢.

Beeswax is in good demand at 25c cash and 28c exchange. SOUTHWESTERN BEE CO.

LOS ANGELES, June 18.—The market at present on honey and wax is as follows: Water-white sage, 7½¢; white sage, 6½¢; light amber sage, 5½¢; light amber alfalfa, 5½¢. All in straight carload lots f. o. b. shipping point. Choice country beeswax 27c per pound. HAMILTON & MENDESON.

NEW YORK, June 18.—Old crop of comb honey is now pretty well cleaned up with the exception of some off quality, odds and ends for which there is practically no demand. New crop from the South is now beginning to arrive, and No. 1 white stock selling around 14c; in some instances 15c; while off grades sell accordingly lower as to quality. We have nothing new to report as to the market on extracted. There is a fair demand at unchanged prices with liberal supplies. Beeswax steady at 30¢.

HILDRETH & SEGELKEN.



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Tells about planting, pruning, spraying and selling fruit and garden truck.

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**The Kind that Does Not Break in Folding**

**Beekeepers everywhere, no matter what their preference may be for  
hives or special apparatus, agree that when it comes to sections that**

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## **WHY IS THIS TRUE?**

### **FIRST**

Because LEWIS SECTIONS are made of Wisconsin basswood—the best material known for sections—the stock used is first carefully selected by the lumber people—but this is not enough—when it reaches the Lewis factory it is re-sorted by the Lewis inspector, leaving only the whitest material to go into LEWIS SECTIONS.

### **SECOND**

Because the V groove in LEWIS SECTIONS is scientifically made—it is cut just deep enough—but not too deep, so that the section will not break when folding or be loose at the corners.

### **THIRD**

Because LEWIS SECTIONS are polished on both sides on a double surfaced sanding machine which was designed in the Lewis plant especially for this purpose.

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Because LEWIS SECTIONS are packed in a tight wooden box entirely enclosing contents—no discoloration from air or sun can occur, no matter how long they are carried in stock—this package is strongly braced at all corners, insuring delivery in good order.

At the same price you pay for other standard makes of sections you get all of the above—the making of Lewis Sections has been under the supervision of a Lewis Section Expert who “has been at it” for over thirty years—no wonder Lewis Sections are perfect. One of our customers tells us that he has put up (folded) thirty thousand Lewis Sections in a season, and has not found one section in the whole lot that was not perfect. Can we mention any more convincing evidence of quality? Can you say the same of even five hundred of any other make?

**Insist on the Lewis Sections Look for the Beeware Brand**

**G. B. LEWIS COMPANY, WATERTOWN, WIS.**

*Catalog on request giving nearest distributor*



Vol. LVI.—No. 7

HAMILTON, ILL., JULY, 1916

MONTHLY, \$1.00 A YEAR

## Importance of Full Sheets of Foundation in the Broodnest

Some Observations on Losses in the Average Apiary Because of  
Neglect to Secure Good Combs

—By Our Staff Correspondent

**O**NE of the things to be impressed upon the writer as a result of his work as a bee inspector, is the enormous losses among the beekeepers generally from rearing useless drones. It is not uncommon in neglected apiaries to find hives with from one third to more than one half drone comb. In some apiaries where good equipment is used and fairly good practice followed otherwise, this fault is still common. It is very evident that the owners of such outfits cannot realize the great cost of rearing such large numbers of loafers in the hives where they should be producing a profitable working force, otherwise such conditions would not be tolerated.

It requires as much food and atten-

tion from the nurse bees to rear drones as workers, and drones will continue to be a tax on the colony when mature, as they are consumers and not producers. It will readily be seen that a colony that is raising twenty-five percent or more of drones, will seldom yield a satisfactory profit to the owner. At the last Iowa convention, C. E. Dustman had an interesting paper on drones. He estimated that a square foot of drone cells would produce more than two thousand drones, while the same amount of space would produce more than three thousand workers. [Drone comb over 5,000; worker comb over 8,000.—E.]

The writer has often found it hard to convince the novices of the full

value of full sheets of foundation. The first cost looks big to them, and they prefer to let the bees build their own combs with a narrow strip to insure that they will not be built crosswise. To show something of the habit of the bees, we have gone to considerable trouble to get a series of pictures that show the real condition more clearly than any amount of description. The impressions on the foundation being exactly the shape and size of worker cells, the bees will build most of the cells of this size where the foundation is used. Drone cells, being larger, require less wax in the construction of an equal amount, and probably less labor as well. This being the case wherever worker cells are not needed for immediate use to meet the needs of the queen, drone cells will be built, for they serve as well for storing honey. Figure 1 shows an ideal comb attached to all four sides of the frame and composed entirely of worker cells, most of which contain sealed brood. Such a comb can be used anywhere, whether for a brood comb or an extracting comb. Figure 2, shows a comb which is composed mostly of drone cells, as the result of using a narrow starter instead of a full sheet of foundation. The high arched cappings show that many of these cells contain drone brood. The cost in honey necessary to raise a single brood of drones, in such a comb, would pay for a full sheet of foundation. This comb can be used as an extracting comb, but is a nuisance, since if it chances to get into the brood nest, a lot of drones will be the result. Usually it will pay to melt up such combs at once and replace them with full sheets, rather than risk getting them used in this man-

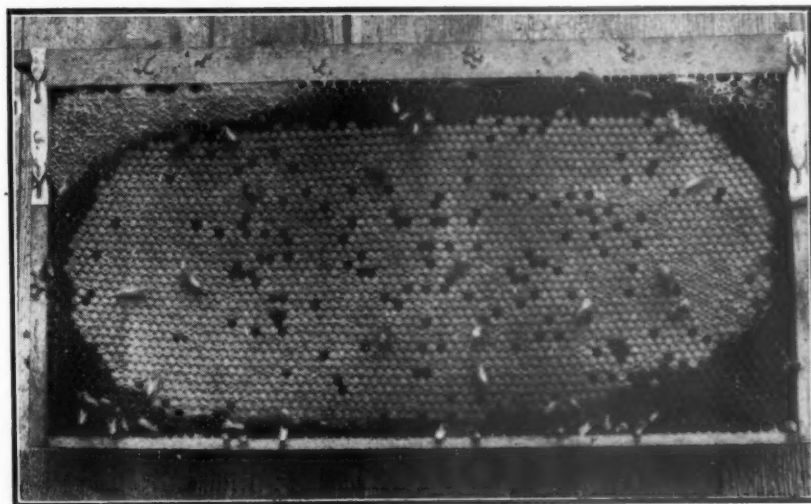


FIG. 1.—FRAME OF SEALED WORKER BROOD AS A RESULT OF USE OF FULL SHEETS OF FOUNDATION

ner.

Aside from the drone cells, there is also much difficulty in getting smooth combs all the way down, with narrow starters. Figure 3 shows such a comb that is not only composed mostly of drone cells, but also is so uneven as to be a bother in uncapping or manipulating.

The bees will always build some drone comb in the best regulated hives and a small amount is not objectional. A few drones are necessary, of course, to fertilize the young queens that emerge during the season, but there is little danger that there will ever be a shortage for that purpose under normal conditions. Figure 4 shows how the bees will build small clusters of drone cells at the ends and corners of foundation. Most of the surface, however, is occupied by worker brood.

If combs are damaged in any way the tendency is always to repair them with cells of the larger size. Mice

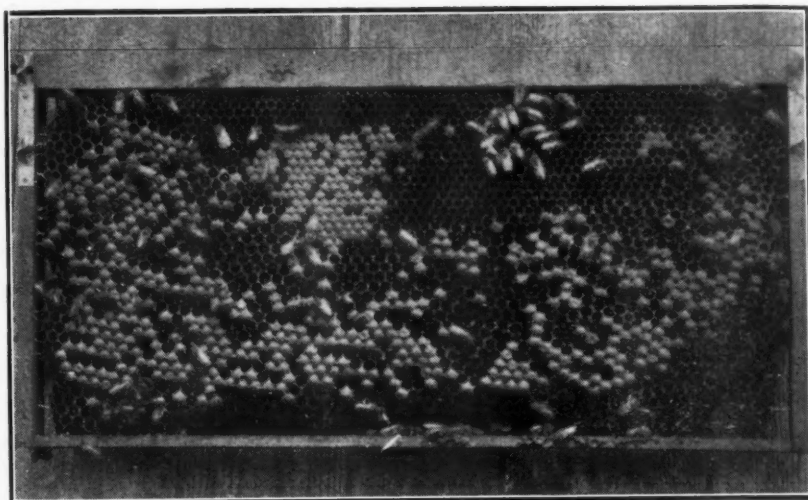


FIG. 2.—FRAME WHICH CONTAINS MOSTLY DRONE-BROOD—RESULT OF NARROW STARTER

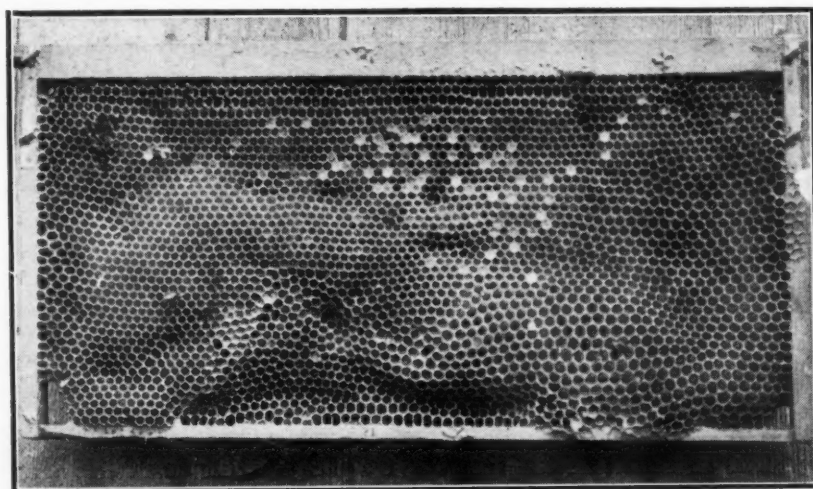


FIG. 3.—COMBS BUILT WITH LESS THAN FULL SHEETS NOT ONLY CONTAIN MUCH DRONE-COMB, BUT ARE IRREGULAR AS WELL

are fond of gnawing the combs, and where the entrances are left large enough in winter, they are likely to enter the hive and cause a lot of damage. Figure 5 shows an extracting comb that has been injured by these little animals. If the injury is slight, as in this case, it will not pay to destroy the comb. However, it is likely to be repaired in the same manner as was the one shown at Fig. 6. Figure 7 shows another that has been repaired with the larger cells and utilized by the queen so that at the time the picture was taken the repaired portion was filled with sealed drone brood.

I am convinced not only that it pays to use full sheets of foundation, but also, that without it honey production can never be profitable. That I practice what I preach is evident by the fact that I am just finishing putting in 1200 full sheets for use in one small apiary, in replacing discarded combs and providing reserve extracting combs.

The use of full sheets of foundation in the sections is also much more common than formerly. The sections

are occupied so much more readily, drawn so much quicker and filled so much more evenly that there is no question of the economy of full sheets in the sections. However, the use of full sheets in the brood nest is a vital matter, for without a large working force, big crops can never be harvested. The rearing of several thousand worthless drones, to consume the honey, take the attention of the workers and get in the way generally, does not tend in this direction.

### More Bees or Greater Intensity?

ARTHUR C. MILLER.

THE question has been put to me as to whether we should work for decreased cost of production or increased per colony yield? It is a good question, and is one which every producer should ask himself and ultimately will have largely to decide for himself.

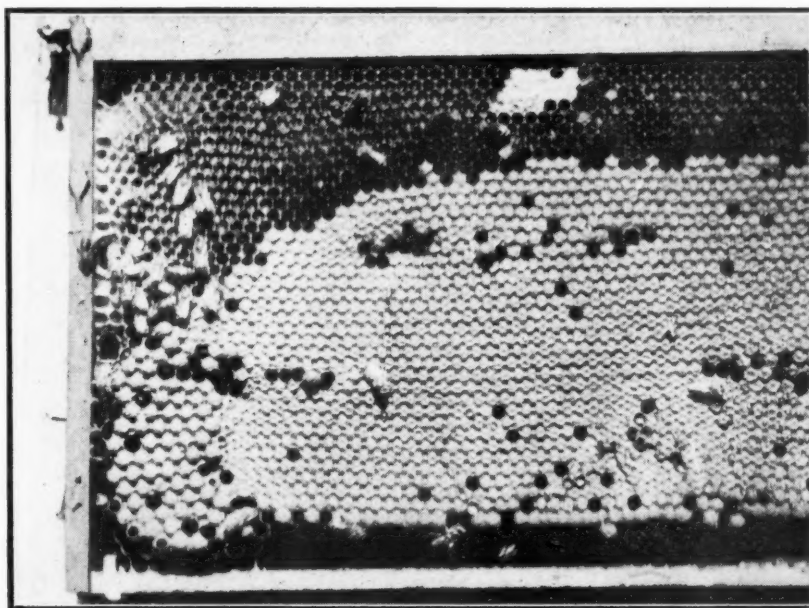


FIG. 4.—DRONE-CELLS IN LOWER CORNER BUILT ON FULL SHEETS



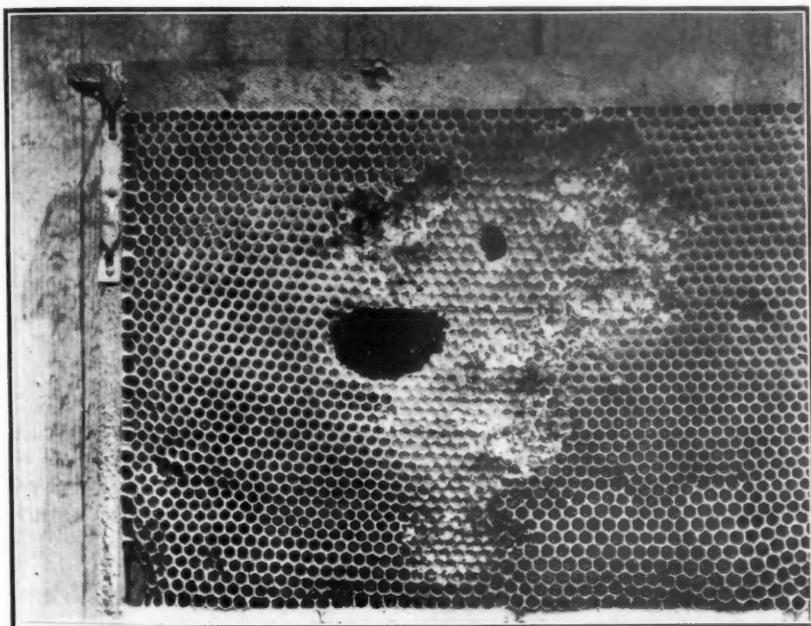


FIG. 5.—HOLE IN BROOD-COMB GNAWED BY MICE

The conventions and the bee-press have always devoted most of their time and space to manipulation and apparatus. To prove that these have brought progress it is scarcely necessary to compare present per colony yields with those of box-hive days. But the *cost* of manipulation has been ignored and that of the apparatus not considered as broadly as it should have been. Perhaps times are changing with us and we shall come to consider the interrelation of capital, apparatus and labor.

Before entering on the discussion of lowered cost *versus* increased yield (which are in a sense synonymous), it were well if we differentiated between those who depend on bees for all or a large part of their living and those who keep them as a side line. The first man must decide whether he shall put in more time on his present outfit or more capital in equipment for more bees; in other words, shall he push

harder the bees he has or keep more bees? The second man must either push harder or maintain present average with less labor.

The relation of equipment to cost of operation is a delicate one. It is easy to put too much money into equipment and it is equally as easy to add materially to one's labor by insufficient or poorly made and ill-fitting apparatus. There is a fine field for the exercise of good judgment in the matter of equipment.

Taking the case of the specialist and granting a well chosen equipment, can he sufficiently increase his per colony yield by different or increased manipulation to pay for the labor, or will he make more money by using less manipulation and putting his time into caring for more bees? Will he make more by investing more, hiring more help and generally spreading himself, or will he do better to devote every possible moment to just what bees he can care for himself?

Dr. Miller and Miss Wilson are shining examples of what may be accomplished by the intensive method, but the cost of securing those results they have not given.

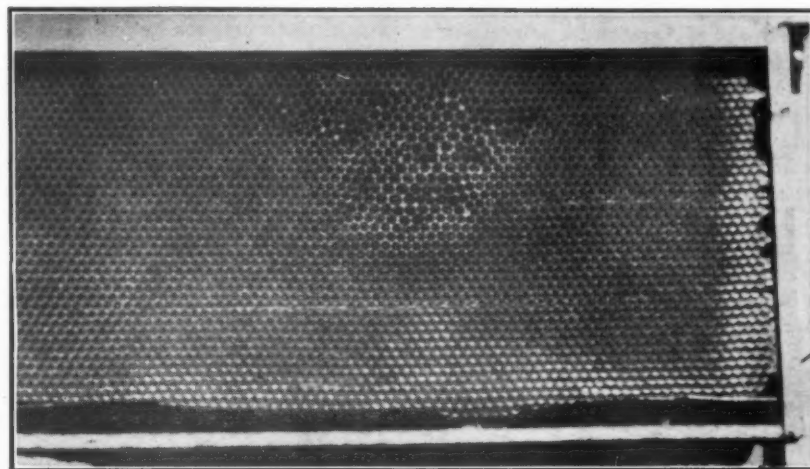


FIG. 6.—DAMAGED COMB REPAIRED WITH DRONE-CELLS

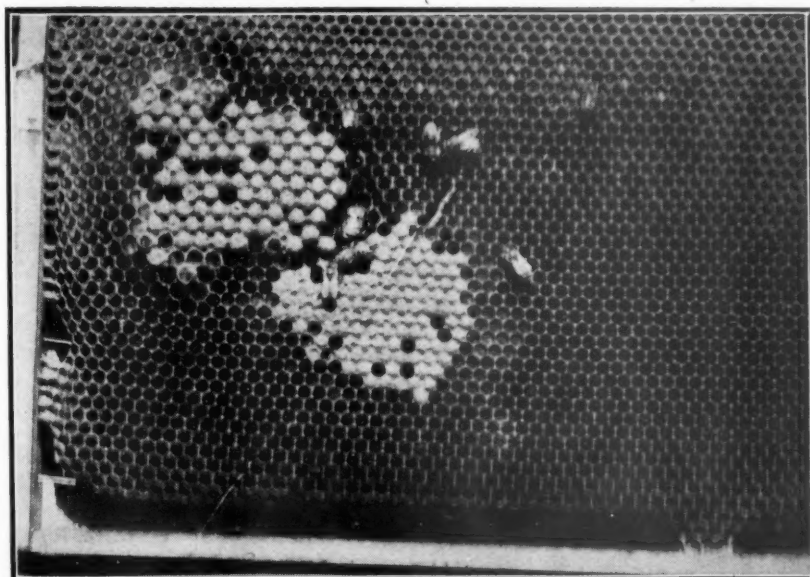


FIG. 7.—DRONE-CELLS WHERE A DAMAGED COMB HAS BEEN REPAIRED

The chains of apiaries run by some of the New York beekeepers and the big apiaries in the far west, both run on the "hustle and finish" plan, are good types of the other method; but here also we have no figures of the cost of operation.

It must be admitted that the individuals and their circumstances may determine which line to follow. Dr. Miller and Miss Wilson would not care to follow the wide-spread plan, nor would the beekeeping world want them to, for the restful peace and joy of their apiary and home shine forth over the whole beekeeping world. And when one looks upon the scenes of their labors, one can but ask if a lot of the hurly-burly and bustle of business life is not a great big mistake and that the rushing, wide-spread beekeepers would be better off if they should mix in a little more of the thoughtful life and ways of the sage of Marengo.

I have not answered the question which opened this article, and I did not intend to when I began. What is the answer?

Providence R. I.

# American Bee Journal



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C. P. Dadant, Editor  
Dr. C. C. Miller, Associate Editor,  
Frank C. Pellett, Staff Correspondent.

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## THE EDITOR'S VIEWPOINT

### Cooperation Among Beekeepers

Mr. L. L. Poplin, of Raleigh, N. C., writes to the American Bee Journal to suggest that State Beekeepers' Associations should be organized in every State. Where they do not exist, as in his own State, he proposes that the State Board of Agriculture be requested to help by employing the farm demonstrators to arrange county organizations. Further, he wants the farmer bee owners urged to change their old methods to movable-frame methods and cooperation to follow. All this is good. Those beekeepers who live in States where no State beekeepers' association exists should take the matter in hand and correspond with their State Board of Agriculture, urging such work in connection with farm demonstrations. The time has come for active work in this line, as well as in all agricultural colleges.

### Inspector of Apiaries

We understand that a movement is on foot to create in Illinois a State Department of Agriculture, and put under its secretary the State Veterinarian, the Biological Laboratory, the Nursery inspectors and the Apiary inspectors. This is all right. But they further propose to have an inspector of apiaries and nurseries. We suggest that a man who is very good at examining trees for San Jose scale will probably be unable to properly examine a hive of bees. On the other hand an apiary inspector would probably be an inefficient nursery inspector. Are we going to make a shoemaker out of a tailor? If so we will have poor shoes or ill-fitting clothes.

### Dr. Brunnich's Article

Dr. Brunnich, whose article appears further along in this number, is a splendid microscopist. Those photo-

graphs of magnified sections of combs give a clear conception of the comparative increase of thickness of the base of the cells and of the side walls. They show that the cast-off skins and dejections of the larvæ at the bottom of each cell increase its thickness much faster than the cocoons thicken the side walls.

But concerning the bees changing worker-comb into drone-comb, we are rather skeptical. Following every assertion of such a change, we have so far invariably found that the bees did not tear down to rebuild in another kind any of the comb given them, but that they only filled such spaces as were accidentally left open, or where combs had been broken down or removed. It was only in case of very imperfect cell base that even the foundation given them was ever changed. I will remind Dr. Brunnich, of his stating to me, among other interesting experiments, during our visit at his home in August, 1913, that he tried supplying a swarm with a hive full of drone-comb, and that the only thing they did was to narrow the mouth of those drone-cells to the proper opening for worker-cells, when the queen laid worker-eggs in them. This confirmed the similar experiments of Editor Cowan of England, of Drory of Bordeaux and myself. Now if bees do change worker-comb into drone-comb, why would they not do the reverse?

This question has some importance, for an excess of drones induces bees to swarm and drones cost a large amount of honey, without returns, unless wanted for breeding, from the best colonies.

### Care of Honey

Although carbon disulphid is the easiest drug to use in destroying the moths, the old brimstone method is still good. To destroy the moths in a

room where you keep your comb honey, burn enough of it to kill the flies. It will kill the worms and the millers also. By repeating the operation after a couple weeks you will destroy what there may be left of worms hatched from the eggs in the meantime. Of course, it is best to have the honey cases sufficiently open so the fumes may pervade them.

Extracted honey should be thoroughly ripe when put up in retailing packages. If not quite ripe it should be kept in a tank, in the hottest room of the bee-house or of the home. Every one of us has had unripe honey which might have been improved very much by proper management.

Quality is indispensable to secure customers and retain them.

### Pennyroyal Honey

E. M. Rennolds has sent a sample of Florida honey that he says is as nearly pure pennyroyal as can be secured in a general way.

It is light amber in color, very clear, somewhat light in body, with a flavor of its own, very distinct, but not at all like the flavor of pennyroyal leaves. It would no doubt rate among the average amber honeys, and some might prefer it to any other honey, light or dark.

C. C. M.

### Practical Method of Rearing Queens in the Average Apiary

There has been much discussion as to whether it pays the ordinary beekeeper to rear his own queens. This is a question for every man to settle for himself. Some of our largest honey producers say that they cannot afford to rear their own queens. Others and very careful ones say that they would not accept any queens in their colonies except those of their own breeding. However, since many beekeepers think they cannot afford to buy queens in a wholesale manner, they should be familiar with the ordinary method of queen-rearing.

To the beginner there is usually much of mystery in this subject, which is one of the most interesting things in connection with the business of honey production. Most beginners start with scrub bees. Nine out of ten buy black or hybrid bees, which are undesirable from any standpoint. It is fortunate for the beekeeper that a change of stock from the poorest scrubs to the best of the pure races is such an easy matter. Simply by replacing the queen with one of the desired stock the colony is shortly made over. There are several thousand new readers of the American Bee Journal, many of whom



beginners who are not familiar with the practices of the veteran, and it is for their benefit that this article is prepared.

The first essential, of course, is a pure queen to serve as a breeder. If one has none, a good one should be bought from a queen-breeder who has desirable stock. As a rule it is not indispensable to buy tested queens, since two or three untested queens can be bought for the price of a select tested one, and if one buys from a conscientious breeder the untested queens seldom prove disappointing. However, they must be tested before using them as breeders.

#### REQUEENING A WHOLE APIARY FROM ONE PURE QUEEN.

With one purely mated Italian queen it is quite possible to requeen a whole apiary of ordinary bees and have them all practically pure Italians at the end of two or three years. If the beekeeper has 100 colonies it will be necessary to rear as many queens and replace the hybrids already in the hives. The

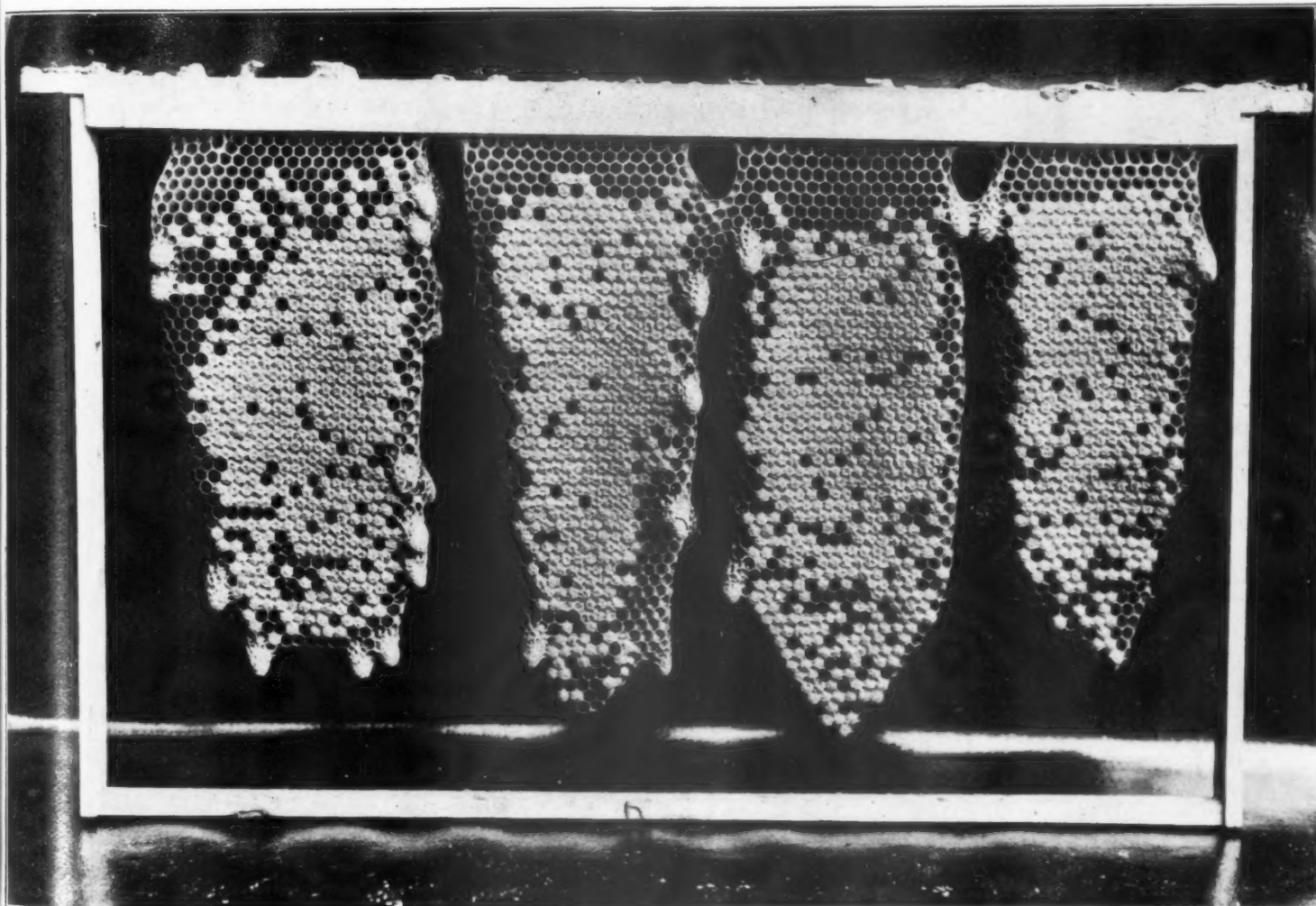
young queens will of course be pure stock, but since many will mate with the hybrid drones their workers will all be crosses also. However, we now know that the mating of a queen does not affect her male offspring, and if her mother was purely mated all her drones will be pure. Thus we will have thousands of pure Italian drones within a few months. If the first queens are reared early in the spring, a second lot can be reared from the purely mated mother in August or September and used to replace those of the first ones which are impurely mated. By this time most of the drones present will be pure Italians, so that the percentage of purely mated queens will be large. If the first lot are not reared in time to be replaced the same season it can be done the following spring. A little later on a third lot can be reared to replace such as are not purely mated and thus we have the whole apiary Italianized with little outlay except the time necessary.

If the beekeeper thinks he can afford

it, he will buy several good queens to begin with and will rear as many drones as possible from those which he does not use for producing queen-cells. To rear plenty of drones in a good season is not difficult. It is only necessary to place drone-combs in the center of the brood-chamber. The greater difficulty is in preventing the rearing of drones in colonies that are undesirable as breeders. To do this in early spring, we remove the drone-comb from those colonies and replace it with worker-comb. In spite of all you can do, some drones will be reared in corners. But the processes indicated will greatly increase the possibility of pure matings.

#### REARING THE QUEENS.

The cell-cup or Doolittle method of rearing queens will not be touched in this article. He who wants to rear queens in large numbers had best secure the Doolittle book. We exhibit the cell-cups and the matured cells only to show the method as compared to the natural way.



GETTING A LOT OF QUEEN-CELLS ON A FRAME BY DR. MILLER'S METHOD



## American Bee Journal

In the August number of our Journal for 1912, we gave a cut of Dr. Miller's method of securing a large number of queen-cells from one comb in a strong queenless colony. We reproduce it here, for the benefit of the novices. The colony containing the breeding queen is supplied with one or more frames of foundation or of new comb, cut into strips to secure plenty of edges, since the bees build queen-cells in preference on the edges of the combs. As soon as the queen has filled one of these combs with eggs, it is placed in the center of a strong colony after depriving it of its queen and of most of its young brood. It is well to trim the edges of this comb with a sharp knife, as during the repairing the bees are the more likely to build a great number of queen-cells. This is the best method of rearing queen-cells

the operation was successful. If not, and the bees have reared queen-cells of their own brood, destroy these and give them a cell from the second batch.

September is a fine time to requeen an apiary. By this time the honey flow is about over in most northern or central localities, and few colonies with a fall-hatched queen will swarm the following season if properly handled. In the way above described the queen is mated from the hive in which she is to remain, and the beekeeper is saved further trouble except to make sure that colonies where the queen fails to return from her mating trip are properly supplied with another queen. For this purpose it is well to have a few queens reared in nuclei. The nuclei made for queen-rearing are usually united together or to some neighboring colony just before winter.

Colonies which are rearing queen cells must be strong and well supplied with honey. Queen-cells must be handled carefully and placed as near the center of the brood-nest as possible so as not to be neglected. The colony from which a young queen is to mate must be closely watched to ascertain when the queen is laying.

### Breed from the Best

If you can buy better stock than you now have, your first step toward improvement is to buy a tested queen of that stock—perhaps still better two or more untested queens. You may as well have all the advantages of the improvements that others have made. But you are not to stop at that. It is only a first step. With that as a start, you are to begin a ceaseless effort toward further improvement, which effort is only to end with the end of your life.

You must know your stock, must know each colony, and *the most important thing to know is the amount of honey each colony gives you as surplus.* No indefinite guessing about it, but you must put down in black and white each pound of honey you take from each colony throughout the season. You may be surprised to find how great the variation, and especially at the small amount you get from the poorest colonies. Like enough you will find that the best colony gives at least five times as much as the poorest.

Suppose you have five colonies, and from them you get in a given season 20, 40, 60, 80, and 100 pounds, an average of 60 pounds to the colony. Then in-

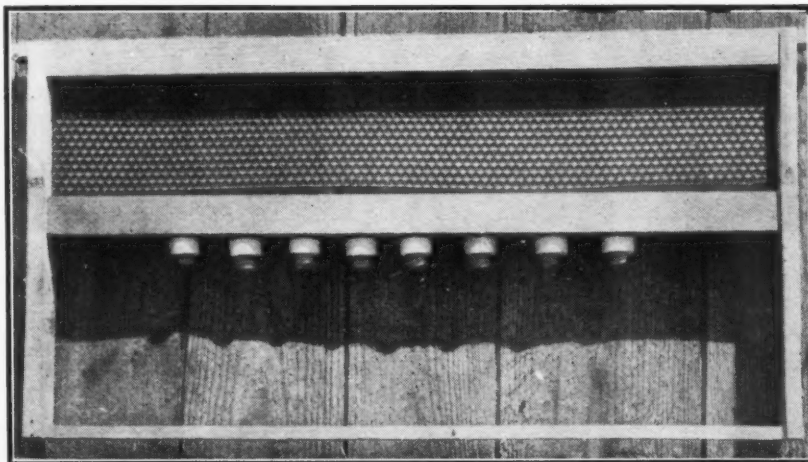


FIG. 1.—FRAME OF CELL-CUPS READY FOR THE LARVÆ

naturally in comparatively large numbers from your choice queens. The process may be repeated as often as necessary. Usually we repeat it in about five days in order to have fresh queen-cells to replace the ones which may have accidentally been destroyed in inserting them in colonies.

When the cells are nearly mature, usually nine days after the operation just mentioned, open the colony and count the queen-cells. One cell, of course, must be left in this colony. The others may all be used in requeening colonies of undesirable stock. Make as many colonies queenless as you have cells to spare, during the afternoon of that ninth day. The next morning, carefully cut out each of these cells with a sufficient amount of comb to make sure that the cell itself will not be injured and insert it carefully in the center of a brood-comb in each queenless colony. Within five days you may readily ascertain whether

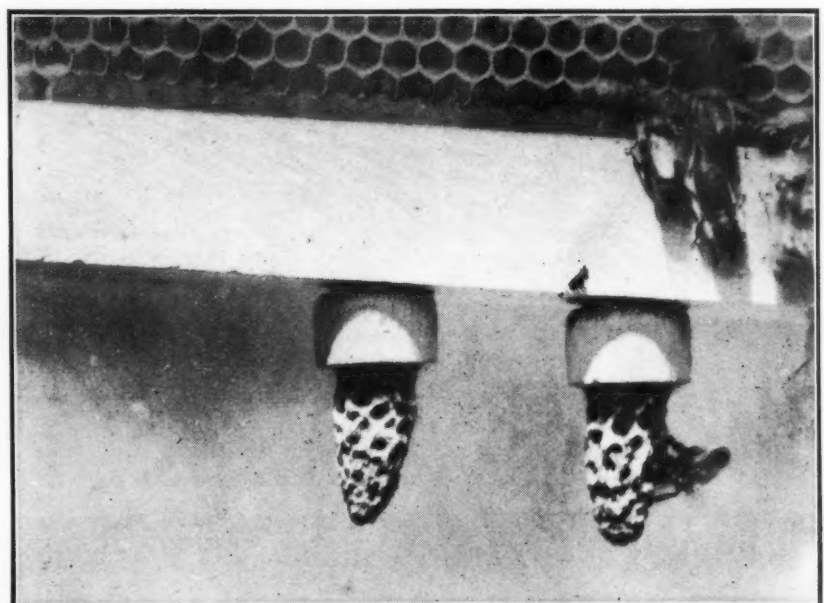


FIG. 2.—FINISHED CELLS BY THE DOOLITTLE METHOD

## American Bee Journal

stead of allowing each colony to continue its own stock, suppose you requeen the two poorest from the better stock, and suppose that should only bring them up to the average, 60 pounds. The increase of surplus from the two colonies would be 60 pounds, or 30 pounds for each of the queens you have introduced. Right here it may be worth while to stop and inquire whether it might not pay well to buy two queens, say at a dollar each, for those two colonies. With a gain of 30 pounds each, you would need to sell it at only  $3\frac{1}{2}$  cents a pound to come out even, and all you would get more than that would be so much clear gain, with only the trouble of introducing two queens. Instead, however, of buying, it may be still better to requeen from your own stock.

But that 60 pounds is the smaller part of the gain. You have brought up the average from 60 to 72 pounds per colony, an increase of 12 pounds per colony, and the beauty of it is that, with any kind of proper management on your part, that increased average of 12 pounds is to continue year after year.

Having secured a definite record of the performance of each colony, you are now to choose the colony or colonies from which you will breed in the following season. Two ways are open. One will tell you "Breed from the colony that gives you the most honey." Another will tell you, "Don't do that. A colony that gives away above the average yield is a sport, a freak, and young queens reared from the queen of such a colony are inclined to sport in their turn. Having departed from the fixed type, some of their progeny may be good, and some may be very poor. Breed from those that are just a little above the average, and you will hold the gain you have made, and thus gradually and surely you will advance the character of your stock. Slow but sure is the better way." To this will be replied, "There is much truth in what you say, but I have tried the plan of breeding constantly from the best, freak or no freak, and I know that I have made great gain. Of course, I cannot say what might have been if I had followed the other plan, but I doubt if I would have gained as rapidly."

So there you are, and you can take your choice of the two plans, or, indeed, use both. In either case, your record is important. Not only is it important to know which queens are best, or a little above the average, but perhaps it is still more important to know which colonies are below the average,

most important work is to weed out the poor stock, replacing with something as good as the average, or better. The great thing is that this weeding out shall be persistent and constant. For after the poorest have been weeded out one year, although there shall be none so low the next year, yet the standard has been raised, and any below that raised standard must in their turn be weeded out, and so on year after year.

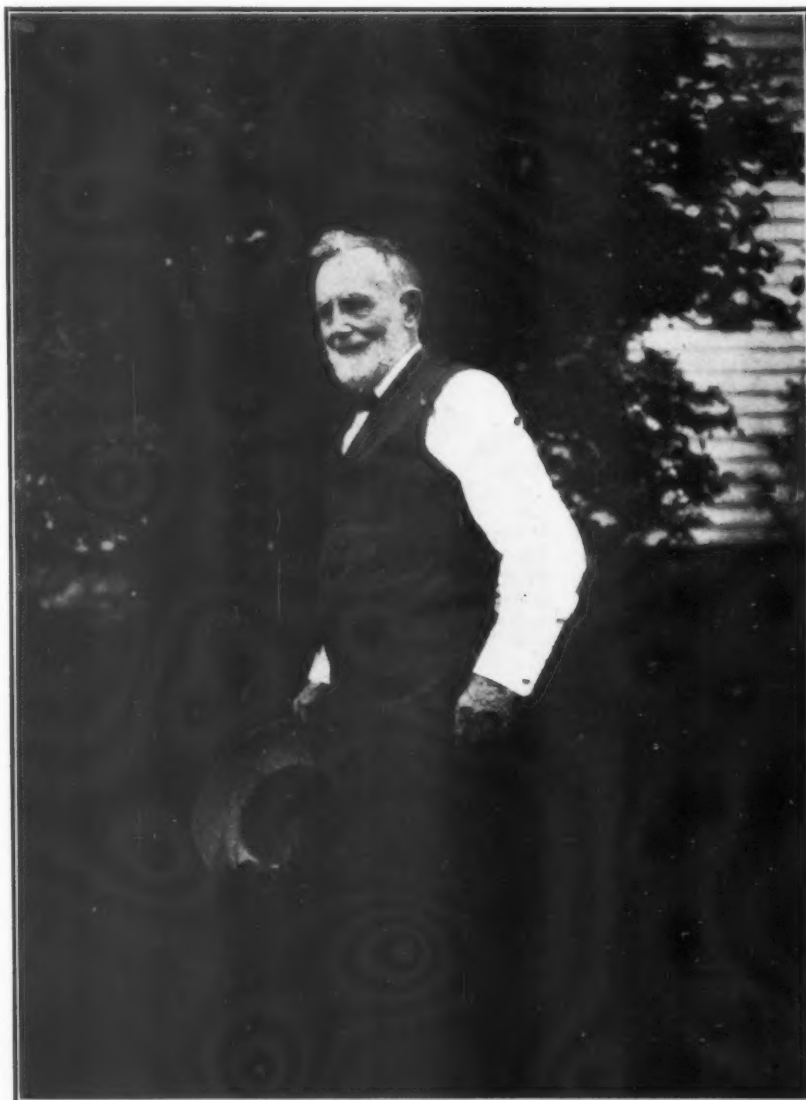
But while the number of pounds surplus is a matter of exceeding importance in selecting a queen from which to breed, it is not the only thing. If you should decide that you will follow the plan of breeding each year from the very best, freak or no freak, and should find a colony giving a yield decidedly beyond that of any other colony in the apiary, and yet it should happen that this colony should be ex-

ceedingly vicious in temper such colony for it is possibly true that your should at once be ruled out as a proper one from which to breed. If section honey is the aim, then a colony would be ruled out eligible for a breeder if it should show sections so filled as to have a watery look. After throwing out any colony with an objectionable trait of any kind, there will still no doubt be plenty to choose from. So keep right at it, year after year, until you reach that point where every colony in the apiary is just as every other colony, and then—but just wait until you reach that point.

C. C. M.

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**Southeastern Iowa Field Meet.**—A field meet for the beekeepers of southeastern Iowa is to be held at the J. I. Danielson queen-rearing yard, Fairfield on July 27. All are urged to come. An interesting time is in store.



DR. MILLER AT HOME—Photograph by E. F. Phillips



# American Bee Journal

## No. 2.—A Trip Through Texas

BY THE EDITOR.

**M**ARCH 10 was the day set for the first local beekeepers' meeting at Pearsall, county seat of Frio county, 60 miles south of San Antonio. The State Entomologist, Mr. F. B. Pad-dock, who had promised to accompany us, was unable to leave the college before the following Monday, so we went with friend LeSturgeon and his wife only. At our arrival, the first man I met, when stepping off the train, was the president of the local association, Frank Talbot, who turned out to be from our county in Illinois. Both he and his wife were as delighted as we were. They invited us for lunch before the meeting and we had a feast.

At the meeting, which followed and took place in the Court House, we met 15 or 20 beekeepers. The Texas sources of honey were discussed. Besides the mesquite, some of the leading honey producers are the guajilla (huajilla, pronounce waheeya), or *zygia brevifolia*, like the mesquite a mimosaceæ, producing fine white honey; the cat-claw (*Acacia gregii*), another shrub yielding plentifully; the horsemint furnishing honey which is called "a little strong," indeed, and numerous others. Of course, in the cultivated spots, the cotton plant yields honey also. The hackberry was in full bloom and bees working upon it. I am told they get honey as well as pollen from this source.

I asked a question which brought a short discussion. What is the color of beeswax when first produced by the bees? Most authors call it "pearly white," but is it always so, even when the bees are gathering yellow honey? The beekeepers of the sainfoin districts of France state that while gathering that exceedingly white honey their bees produce dark wax. The pollen of sainfoin is brownish. Along the lowlands of the Mississippi river, during a flow of Spanish-needle honey, the combs assume a yellow color. What is, after all, the original color of beeswax?

Opinions were divided. It ought not to be difficult, if the wax is colored only after production, by the action of pollen of deep shade, to make sure of the color of the newly made scales. Yet no one could speak positively. Some held that, since wax is a product of digestion, its color must be the same regardless of the color of the pollen or the honey. To this Mr. Talbot replied that cows produce butter of different shades according to the food they get. He also said that steers fattened upon corn yield white tallow while in the steers fed upon cotton-seed meal the tallow is yellow. Why should not the bees produce wax of deeper shades when they feed upon dark yellow honeys? This reasoning seems plausible, and the beekeepers agreed to watch more closely the newly formed wax-scales and report in the Bee Journal. It is quite probable that we will have to change slightly the description of wax-scales as "pearly white," in our text books.

The foulbrood situation is well in hand in Frio county. Mr. R. A. Little, the inspector for that county, reported

finding only two cases in 1915. But sacbrood is plentiful at times. It always disappears in summer. There is no European foulbrood in Texas.

The readers will perhaps remember that in our February number the distance bees fly for honey was discussed, and that Texas, with its extensive plains, was suggested as perhaps the most favorable to long flights. This was a good opportunity for investigating the matter. But practically every beekeeper declared that in his experience bees rarely went beyond a mile or two though they can fly much farther. Mr. Talbot mentioned having had seven colonies at one spot which harvested honey from the bitterweed, so as to produce a surplus of that bitter honey of 60 pounds per colony, while 75 colonies, 1 1/4 miles away, secured no bitterweed honey at all, even although the crop of mesquite honey was about over when the bitterweed came into bloom. The statement quoted on page 49 of February, that Mr. L. B. Smith reported his bees as working, by preference, at the distance of 4 miles rather than within one mile of their home, was not confirmed by any one.

The consensus of opinion is that bees smell the honey odor brought by the wind. As the wind helps them in their return trip, it was said that they were most successful when working in the direction of the prevailing breeze.

"This," said friend LeSturgeon, "is another evidence of the mosaics of Nature fitting together so well. If they went by sight the bees might fly with the wind. When they had to return against it, in a heavy honey flow, countless numbers of them would never regain the hive. To my mind this is one of the strongest arguments in support of the smell theory as against the sight."

The next day was spent in a trip to Pleasanton, Atascosa county. As the distance was but about 35 miles from San Antonio, we made the trip with Mr. LeSturgeon and his wife, in their automobile. The day was fine, and we stopped here and there to examine the vegetation. It is astonishing to see so many blooming plants in such a drouth. In some spots the ground was covered with a carpet of purple verbenas. As they had not had any showers for about two months and no real rain since August (we were then in the middle of March), it is evident that all those plants and trees can get along with very little moisture.

Most of the cabins found along the way are inhabited by dark-skinned people. No rain seems to be needed for the crop of little darkies or Mexicans that swarm about those homes in the brush. As my wife put it, there were "more children than chickens." Why do they not keep chickens and pigs? Because they leave home for two or three weeks at a time and "go fishing" and camp out, and they cannot leave anything at home that requires attention and care. There are many lakes in the country and plenty of fish in the lakes.

We saw some daisies and phlox and a number of other flowers. However, we were told that the soil is comparatively bare, on account of the drouth, as the land is carpeted with bloom in ordinary years, at this date. We saw

bull-nettles with fine blooms. These plants are armed with spurs about one-half inch long and a little bag of poison at each spur, which causes more pain than a beesting. The seed is large, shaped like a castor bean and edible, with rich nutty flavor. They are very plentiful, but the barefoot urchins apparently fear neither these nor the rattlesnake dangers. Yet there are rattlesnakes, and large ones, too.

A very interesting little animal, which feeds on insects and roots and gives testimony to the "survival of the fittest" is the armadillo, a four-footed mammal, with a carapace or shell which enables it to get around safely among the numerous thorns. It looks as if a mongrel of the opossum, the turtle and the hedge-hog or porcupine. It is absolutely harmless, and its shell is made into baskets by fastening the end of the scaly tail to the tip of the slender snout or nose. It lives in the ground, and when caught after it reaches its hole, it braces itself with claws and shell, so that a strong man, pulling at its tail can rarely succeed in drawing it out.

But why are plants and shrubs so exceedingly thorny in southern Texas? The catclaw, for instance, is named on account of its thorns having a return curve similar to the claws of the cats, an ugly tree to handle, but a splendid honey yielder. LeSturgeon says that these thorns are another evidence of the survival of the fittest; that in such a climate their thorns are the only thing that protect them against extermination by the grazing animals, in seasons of drouth.

At the meeting, in the Pleasanton Court House, we met the inspectors of Atascosa and Wilson counties, and the State Representative, F. H. Burmeister, who secured the State inspection law, in concert with our old friend and contributor, Louis Scholl, who is also a State Representative.

Here we heard for the first time of the dwindling of colonies, in spite of the mild climate. From the consensus of the reports, I am inclined to think that it is due to lack of pollen for breeding, during a succession of months. Several apiarists practice feeding cotton-seed meal, as we feed flour in the North, for a pollen substitute. I believe this will become popular in Texas, if it is not already so in a number of locations.

There was also reported another kind of dwindling which could not be caused by this pollen shortage. Some apiarists ascribed it to unhealthy honey harvested late in the fall. Mr. J. D. Bell, of Jourdan, accused soured horsemint honey of the mischief. In different countries different sources of honey are claimed to be the guilty agents. It is probably more the condition of the honey, its unripeness, which causes the trouble, rather than the kind of honey. There is ample field for study in these incidents.

Corn is grown and yields good crops, when there is enough moisture. In some comparatively moist spots we saw fields of it. It was about 4 inches high, but suffering. However, they have had a good rain since and the prospect is improved.

Mr. V. Booer, the inspector for Wilson county, made a suggestion worth



## American Bee Journal

recording. When colonies are treated for American foulbrood by the starvation plan and transferred twice, there is a tendency for some swarms to desert the hive, at the second transfer. In prevention of this desertion, Mr. Boorer clips the queen's wings just before treating the colony, and insures the withholding of the swarm. A comb of brood, given after treatment, helps satisfy the swarm.

Mr. Davidson, the Atascosa County Inspector, a man of great experience, mentioned paralysis as a disease quite common after long spells of confinement. He calls it "constipation," which changes to an epidemic, under certain conditions. We believe "constipation" is the better name.

Our next trip was to Hondo, on the Monday following.

[To be continued]

### About the Combs

BY DR. BRUNNICH.

**W**HEN I have the beautiful cluster of an artificial swarm, I often find in the swarm-box a new white comb; then I cannot but admire the charming little work of the beautiful hexagons of wax, which no human master with all the craft of his race and with all the perfect instruments at his disposition can copy. Considering that this little masterpiece is not only a wonder of exactest and minutest architecture, but that it represents the simplest, the most suitable and the most parsimonious cradle, the enjoyment in beholding it is the greater, and one is touched for an instant by a solemn feeling before the wonderful works of the Almighty. These little cells, formed of the very blood of the

bees, represent the *cradles* of the coming generation, they serve as *store-rooms* for the noblest product of the plants, the *pollen*, and for the divine nectar, the *honey*.

But like all things of the world, the golden combs *grow old*, the more generations of bee-children are reared in them from the egg to the full-grown insect, the darker becomes the waxen palace. The fresh new comb is white; it colors in the course of time in the hive to yellow, without brood being reared therein. Already the great Huber endeavored to find the reason of this coloration, without giving a satisfying explanation. Huber found that the bees fasten a thread of propolis on the horizontal edges of the hexagons, partly perhaps to bring the hexagon to the circle, partly for solidity.

Only *breeding* in the new combs changes them in color and solidity essentially. It is well known that the bee-egg evolves in the open cell to the grown-up worm (larva) in 8½ days. The cast off skins, as well as the excrements, are left in the bottom of the cell. Now the larva is enclosed under a porous cover and it spins its cocoon, an extremely fine web, by drawing a thin thread in all directions.

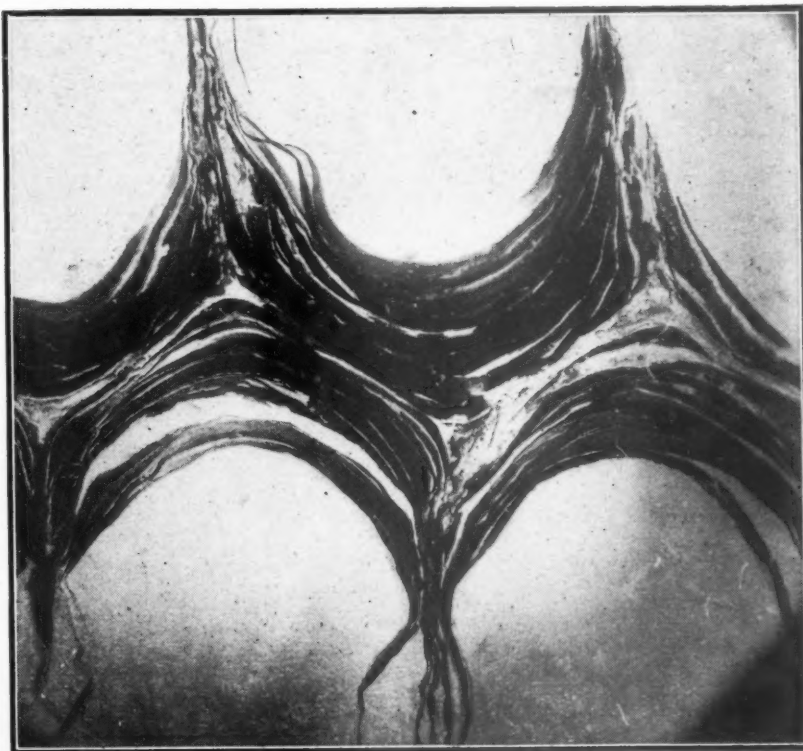
After being spun in, which takes about a day, the larva remains motionless, but in the body of the worm an exceedingly active work begins, the *transformation*; under the subtle skin there are growing feelers, eyes, tongue, legs, sting, etc., there are forming trachea with their delicate clasps or spirals of chitin and the glands. All these are built of a fatty and albuminous substance, which fills the greatest part of the interior of the larva; 21 days after the queen has laid the egg into the cell the young bee is ready to

emerge. As soon as it has left its narrow room other young bees come to prepare the cell for a new egg. They varnish the inner wall of the cell, especially the bottom containing the skins and excrements of the larva, with an extremely thin layer of wax. Before the queen lays an egg, she "looks" with her antennæ into the cell to satisfy herself that it is well prepared.

Every beekeeper knows the brilliancy of the cell-bottoms, when the bees have prepared the brood-nest for the queen. So the young "house bees" have not only to clean their hive, take care of the brood, look after the honey, etc.; every day in the busy season they have to wax and dry—rub over—3000 cells. The accompanying cut shows the schematic section of an old comb. The bottom of the cells has become thick on account of the skins and excrements, the thickening of the walls is insignificant, because the cocoons are extremely slight. If one puts a piece of old comb for some hours into benzine, which dissolves the wax, it is not difficult to draw out one cocoon after the other, like little bags, and by counting all the bags it is possible to establish how often bees have been bred in the comb. If a comb is used for brood only once, its solidity is remarkably augmented, and every one knows the extreme toughness of old black combs.

As a rule, I discard all brood-combs, which are so thickened, that by looking through against the light, they are not transparent at all. These combs are unfit for breeding, and it is chiefly the last years that the bee-men have learned that the bees do not like to breed in those old black combs. My explanation for the antipathy of the bees against old combs is the following: If we examine early in spring a colony with rather new combs, we can observe that the brood-circles on both sides of a comb are very exactly corresponding to each other. It is as if the queen or the bees could recognize across the middle rib of the comb the eggs of the other side. It is clear that this corresponding of the two brood-circles is useful; the larvae on both sides of the bottom of the cells are warming each other. If the cell-bottoms are very thick, it is difficult, if not impossible, to match the brood-circles on both sides of the comb; besides the thick wall between the two larvae is a considerable hinderance for mutual warming. In summer this circumstance is no longer important, but in spring the effect is indeed this, that colonies with old combs cannot develop themselves to the desirable strength.

It is possible that in the United States (where the honey crop is not only five to ten times as large as with us, but also much later and longer), this fact is of little significance, but in most parts of Switzerland and middle Germany it is of the highest importance. Here the bees begin to breed, as a rule, in March, and it requires a good queen and resistant bees for bringing the colony to its full development in the middle of May. Very often the weather in April, and even in May, is wet and cold and frosts are frequent, but as the honey yielding lasts only from the middle of May (sometimes earlier) until the hay harvest, which



SECTION ACROSS A VERY OLD WORKER-COMB

begins sometimes as early as the last days of May, it is absolutely necessary that we have an exceedingly rapid and strong development of the colonies from the beginning of April until the middle of May, or our bees come too late, when the table is already cleared.

It is a strange fact, which I often have observed, that some one begins beekeeping with zeal and love, augments his colonies until his bee-house is full. (You know our hives are, as a rule, close together in a little cottage.) For 6, 8 to 10 years he gets nice honey crops, and then his yard begins to fail. He gets no swarms and has difficulties; the crops become more and more meager. The bee-man loses his interest in bees and his colonies languish, or a bee-disease makes short work with them. This phenomenon finds its simple explanation in the growing old of the brood-combs. In the beginning the hives had beautiful new combs, thrived, and even gave swarms. Later on, when the house was full, the beekeeper did not think it necessary to give foundation to his colonies, and the poor bees were obliged to spend their lives on the old, thick, black combs. It is no wonder that they no longer swarm, owing to the bad development in spring.

With our poor seasons we are obliged to do in every line our best, and therefore a regular renewal of our brood-combs is a *conditio sine qua non*? I for my part give every year to each colony two sheets of foundation; in winter my bees occupy 10 combs, 10½ x 14 inches; in summer 11 to 13 combs. In spring or summer I hang the old or bad combs behind, for removal in the fall. Thus I remove a number of old or damaged combs, or combs with drone-cells in places where we do not like them. These combs are very useful, if one is running for extracted honey. The drone-cells are cut out and a corresponding piece of good comb is set in. For extracted honey, old brown combs are very good, because those combs do not break in the extractor as new ones do. However, the bees deposit the honey always at first in the brown combs and not in those quite black.

Now a word about *drone-comb*. The experienced beekeeper knows that each colony ought to breed a certain number of drones. A colony without any or with only a little drone-comb does not work with the same zeal and delight as another, which is allowed to breed drones enough. We must not forget that the worker-bees are female, and that in their little heart there must be some sentiment of love towards the other sex. If they have on account of entire foundation no possibility to construct drone-cells, they will satisfy their desire by transferring worker-comb into drone-comb in places where we may not like to have the latter. I let them build drone-comb on the bottom of a center frame, a piece about 4x5 inches, or in 4 or 5 frames I give them triangular spaces in the lower corners of the frame. I avoid having drone-combs in adjoining frames, because the space of 1½ inches is too little for drone-cells. The drone-combs grow old very rapidly and contrarily to worker-comb, the diameter of the cell is considerably diminished in old drone-comb, producing remarkably

small drones. Therefore, I cut away every year in spring the old drone corners or drone rectangles. In April and May it is a pleasure for the bees to fill those empty spaces with drone-comb, and I get stately and vigorous bee-lads. Of course, I avoid giving drone-comb to bad colonies, while colonies with remarkable qualities will be given a great many drone-cells, especially colonies selected for a mating station.

Zug, Switzerland.

## The Senses of the Honeybee

BY N. E. MC INDOW PH D.,

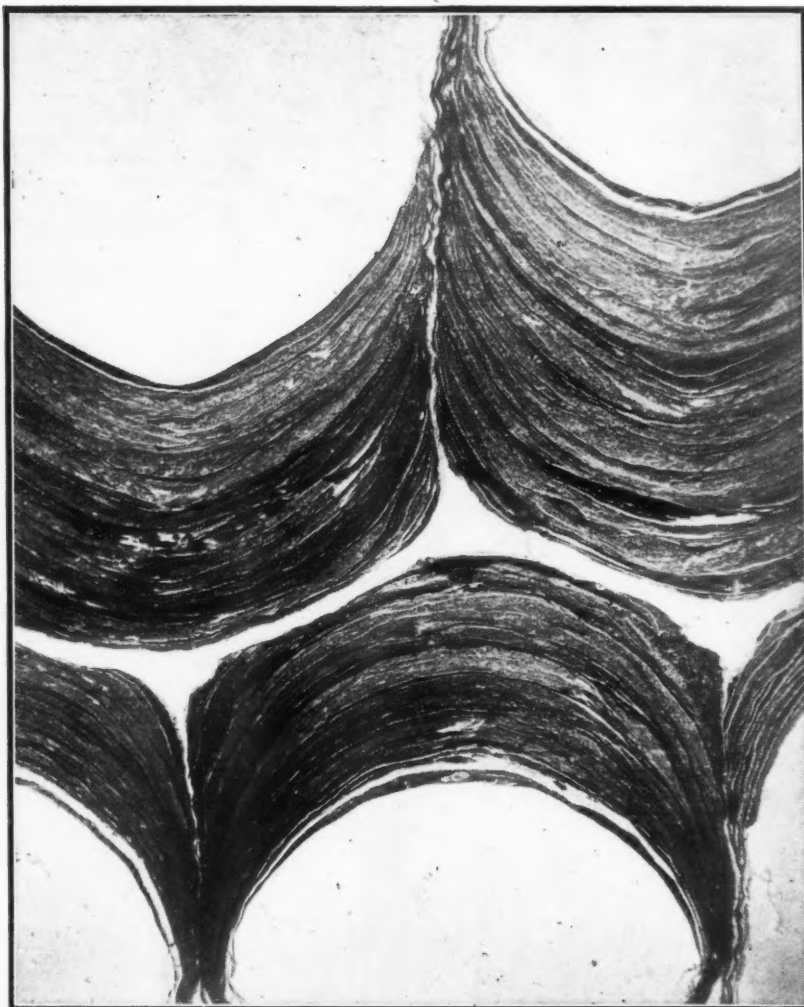
[Continued from June.]

VON BUTTEL-REEPEN thinks that bees have a queen odor, a family odor, a drone odor, an individual odor for each worker, a particular odor for the bees carrying wax scales, a hive odor, etc. He produces almost no experimental evidence in support of his views. The writer is a firm believer in his views, but has not been able to devise experiments to prove most of them.

It is certain that a queen gives off an odor, and it seems reasonable that the odors from any two queens would

be slightly different. It is also quite probable that all the offspring of the same queen inherits a particular odor from her. This odor, called the family odor, perhaps plays little or no use in the lives of bees, for it is certainly masked by the other odors. Drones seem to emit an odor peculiar to their sex, but little can be said about it. It seems certain that each worker emits an individual odor which is different from that of any other worker. It is also probable that the comb builders, nurse bees, and those secreting wax emit odors slightly different from those of the field bees. Such a statement is easily made, but perhaps beyond our means of proving it.

Of all odors produced by bees, the hive odor is probably the most important. It seems to be the fundamental factor or principle upon which the social life of a colony of bees depends, and perhaps upon which the social habit was acquired. It is the same as the nest odor among ants. Without it a colony of bees could not exist, since it is composed chiefly of the individual odors from all the workers in that hive, and is supplemented by the odors from the queen, drones, combs, frames and walls of the hive, etc. In brief, the odors emitted from all the objects within a hive make up the hive odor.



SECTION ACROSS A RATHER OLD DRONE-COMB—MAGNIFIED



# American Bee Journal

From this definition it is easily understood why no two colonies have the same hive odor. The hive odor of a queenless colony is perhaps considerably different from that of a queen-right colony. The absence of a queen odor in the hive odor probably explains why the workers in a queenless colony are irritable and never work normally. All the bees—workers, queens and drones—in a colony carry the hive odor of that colony on their bodies among the hairs. This odor serves as a sign or mark by which all the occupants of a hive know one another.

Since the queen and drones are aristocrats, they seem to disregard the sign that has been forced upon them, but whenever a queen enters the wrong hive, she soon realizes that she wears the wrong badge. Bees carry the hive odor wherever they go. Bees returning to the hives from the fields pass the guards unmolested, because they carry the proper sign, although the hive odor that they carry is fainter than when they left the hive, and it is also partially masked by the odors from the nectar and pollen carried by these bees. A nectar carrier from a strange hive is often admitted because the bees are willing to tolerate a worker carrying a foreign hive odor for the sake of getting its load of nectar.

Bees kept in the open air for three days lose all the hive odor carried on their bodies, but each bee still emits its individual odor. When a colony is divided, the hive odor in each half soon changes so that after the third day one-half possesses a hive odor so different from that of the other half, that the workers from the two halves,

when put together in observation cases, fight one another as though they had been separated all their lives.

When bees are united we are dealing altogether with the hive odor. The mixture of two or more hive odors and more or less smoke so confuses the workers that they do not offer to attack one another.

While a foreign hive odor calls forth the fighting spirit in workers, the queen odor always seems pleasant to workers regardless of whether the queen belongs to their hive or to another hive. This is shown in introducing queens by the cage method. By the time the introduced queen has emerged from the cage she has taken on the hive odor of the workers around her, and for this reason she is perhaps accepted chiefly on account of her peculiar odor not being partially masked by a foreign hive odor. Even if the queen odor forms a part of the hive odor, it is probable that this odor to the workers stands out quite prominently from the hive odor. That workers do not miss their queen for some time after she has left the hive, indicates that her odor thoroughly permeates the hive odor, and that whenever this odor grows faint the workers know that she is not among them.

When a queen is introduced by the smoke method, the hive odor is changed by the smoke, the workers are confused and excited, and by the time they have become reconciled, the introduced queen has taken on enough of their odor to allow her to remain in their hive without being attacked.

Perhaps every beekeeper has witnessed what happens to queens when

they are held too long between the fingers. Odors from the fingers change the hive odor on the queen, and as a result the workers ball the queen. In such a case only a little foreign odor is needed to overbalance the pleasant queen odor. This is further shown when a finger is rubbed over the back of a worker. In observation cases the worker thus treated is immediately attacked by its hive mates.

There has been much speculation concerning the ruling spirit or power in a colony of bees. In the writer's opinion a normal hive odor serves such a purpose. The hive odor is a means of preserving the social life of the bees from without, and the queen odor perpetuates it within. As already stated, the workers know their hive mates by the odor they carry. This odor insures harmony and a united defense when an enemy attacks the colony. The queen odor constantly informs the workers that their queen is present. Even if she does not rule, her presence means everything to the bees in perpetuating the colony. Thus, by adopting the stimuli of these two odors and being guided by instinct, a colony of bees perhaps could not want a better ruler.

The sense of smell of the honeybee is much keener than that of man, and perhaps no other animal, except ants, can compare with it in this respect. The ability of the bloodhound to follow scented trails is only one of the many uses of the sense of smell in the bee. Bees do not follow scented tracks as much as ants, but it is quite probable that queens in flying leave scented trails behind them, and these trails may aid the drones in overtaking the queens.

The sense of smell of the honeybee is poorly developed compared with that of man. It is still a disputed question as to whether bees can distinguish colors, but from the many experiments performed it seems that they can, although perhaps not as we do. It is also doubtful whether they can tell whether objects are round, square, flat, rough or smooth, by sight, although this is easily done by touch when the objects are small. It is certain that bees see long distances, but how distinctly, we do not know. The only use of sight inside the hives is perhaps to tell light from darkness; outside the hives it is perhaps the most important sense used in mating, in finding flowers and in returning to the hives. The writer believes that bees find flowers by seeing them from considerable distances, but when within a few feet of them, they are able to select the ones they want primarily by the odors from these flowers.

We still know practically nothing about the sense of hearing in the bee. Perhaps every beekeeper has heard queens pipe and workers squeal. A worker is almost sure to squeal every time it is pinched or caught in a tight place and cannot escape. When the wings are pulled off the workers continue to squeal, showing that they have special organs for producing these sounds. No such organs have ever been described, but three special organs for receiving sounds have been found. The pore plates in the antennæ have been called organs of hearing, besides special devices to prevent the insect from flying against objects that it can-



SECTION THROUGH A NEW WORKER-COMB, THROUGH AN OLD WORKER COMB, AND THROUGH AN OLD DRONE-COMB



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not see. A second so-called organ of hearing is found in the head at the base of each antenna, and a third one in the tibia (fourth segment) of each leg.

Bees can usually tell when a thunder shower is coming up, and they seem to have a sense of humidity. Unless humidity is sufficiently connected with temperature, bees need a special sense organ to tell dry air because they cannot feel moisture through the hard outside covering, judging from the fact that water does not pass through this covering.

Bees seem to have a sense of temperature, but since heat readily passes through the outside covering they do not need special organs for this sense.

Bees, like people, need a sense of direction, but they probably do not have such a sense. Instead of this sense, the landmarks that they know seem to answer this purpose.

The honeybee has been called a reflex machine. By reflexes we mean those actions which are involuntarily performed, or those actions which are performed without thinking. Most of our daily actions in dressing, eating and working are reflexes, but whenever we care to we can think of doing all of these actions before performing them. The bee, according to psychologists, cannot think, and therefore all its actions are reflexes. But when we consider all the strange things that bees do in emergencies we must admit that bees are more than reflex machines; how much more we do not know, but in this respect there is probably a difference between the various races, and even between individuals of the same race.

If bees cannot think, they do not have a memory, and consequently have no conscience. If this statement is true, how do they find their hives, know their queen and hive-mates, etc.? All this is accomplished by what psychologists call association of ideas. Two examples will be used to explain what is meant by association of ideas. A field bee, ready to return to its hive, flies high into the air, and after seeing a landmark travels in a bee-line. The sight of the landmark called forth an idea concerning this object which had previously been fixed in the nervous system of the bee. This idea was then associated with another idea concerning its hive. After having had several ideas concerning various landmarks called forth, and after having associated these ideas with other ideas, the bee returns to its hive perhaps without making a single mistake. The same method may be used to explain how a worker knows its queen and hive mates, but in this case the queen odor and hive odor are the chief stimuli used in calling forth the ideas concerning these two odors. In turn these ideas are associated with other ideas. Psychologists tell us that the ideas in the nervous system of a bee do not associate with one another until some of them are called forth by a stimulus, and even then these associations are not sufficiently organized to recall past experiences. This is why bees do not have a memory, while with us a stimulus is not always needed in order to cause our ideas to associate with one another,

and further more the associations in our minds are so highly organized that they are able to recall past experiences.

According to the above way of reasoning, bees do not experience pain, but when we carefully consider the behavior of injured bees we are almost convinced that bees do feel pain. Bees with antennae either cut off or pulled off live only a short time. They seem to die from a shock to the nervous system. Another form of shock may even be cited. Bees confined in observation cases without food or water begin to die within an hour after being put in the cases, and all of them are dead within four hours. Bees confined in the same cases with water live the same length of time. Bees confined in the same cases with honey covered with cheesecloth so that they can smell it, although they cannot touch it, live from 43 to 67 hours with 50 hours as an average. There seems to be only one way of explaining such behavior, because the question of starving to death can have no weight. The first two sets of bees soon died because their case was hopeless from the beginning. The third set lived 50 hours on "hopes" only. During all this time they smelled the honey and tried to get it, but their efforts were in vain. Other cases might be cited to show that the "mind" of a bee is more highly developed than psychologists would have us believe.

In conclusion it may be said that if we understood the senses of the bee better we would know how to handle bees better; we could unite them and introduce queens more successfully; we would better understand the conditions governing successful wintering; in short, if we thoroughly understood the senses of the bee, we would thoroughly understand the bee itself and all its activities.

Washington, D. C.

## Home Queen-Rearing

BY D. E. LHOMMEDIEU.

It is now 40 years since I commenced working with bees. I have tried rearing queens for my own use, the various ways advocated from time to time, more or less successfully. Last summer I succeeded in rearing larger and better queens outside of natural swarming than by any other plan, as it comes nearest to the natural cell. The bees that start the cells are not excited more than with natural swarming.

The plan is not new, but ought to be brought forward oftener in the bee journals, as some who keep bees depend mostly upon them for their information.

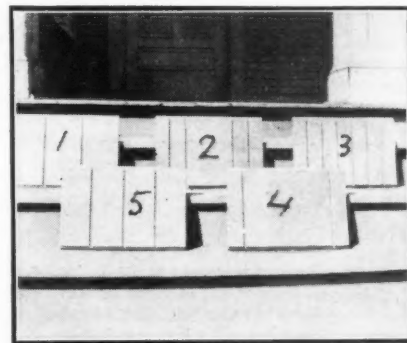
Just a little ahead of natural swarming, when the weather and flow of honey is right, take a full set of brood from a good colony with no hatched bees, place them in an extracting super, set the brood over a strong colony just above its brood-nest, with queen-excluder between, and if all goes well at the end of nine days look up your crop of big queen-cells. If any should not suit you, destroy them. There should be two or three to eight, large and fine, and I cannot discover that they are inferior to the natural cells,

the bees having not been excited or lost any time. Give the good colony from which the brood was taken either combs, brood, starters, foundation or what you think best at the time their brood is taken away. About one colony in ten fails to start cells.

To finish up your large fine cells, there needs to be plenty of bees and heat to carry the cells until the queen is laying, and then she will look almost as large as a bumblebee. Take two combs, bees and all with one cell, place them in an empty hive on a new stand, not closing the hive until evening of the second day; making five or more such nuclei.

The accompanying cut shows how the rear and front boards of bodies may be grooved to supply from 3 to 7 nuclei in one body, by using a rabbit plane 5-16-inch wide, cutting perpendicularly, so that when you slip in the division-boards, it cuts the bees off from passage. These must be full length and depth of hive.

No. 1 will make three small 3-frame



LHOMMEDIEU METHOD OF GROOVING BACK AND FRONT BOARDS OF HIVE SO AS TO MAKE SEVERAL NUCLEI

hives out of one 10-frame body, to be left on the parent colony, if wire screens are used. This should be set above a second story with an excluder above the main body so the queen may not get to the new queens.

No. 2 can be used for one to five queens, or let the bees fill the center apartment and rear two queens at each side.

No. 3 is designed for seven queens to be reared simultaneously if desired.

No. 4 will do for a honey-storing space in the center and one queen apartment on each side.

No. 5 will supply four queens with two combs each.

Each nucleus should have a separate entrance, and a part of them may be placed at opposite ends or at the sides. Colo, Iowa.

## Breeding Queens

BY ADRIAN GETAZ.

CHOOSE for breeding queens the very best you have, that is the rule. But which are the best? Evidently those whose colonies have given the best returns. We rear queens, not for their "personal" qualities, if I may use the expression, but for the qualities of the workers they produce. That is not all yet. We want bees

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still better than those we have if such can be obtained at all.

How shall we proceed in selecting our queens in view of improving our stock? Two ways or two systems present themselves. One is to cross bees of different races in the hope that among the crosses something far better than either parent stock may eventually be obtained. That is what Burbank has done with plants. After a superior plant has been obtained it may be propagated indefinitely by cuttings and grafting. But that cannot be done when crossing animals.

We may gather a few lessons from stock-breeding. The greater the difference between the parent stocks the greater will be the variations between the crosses and their descendants. Hence, to obtain something new and superior, stocks as different as possible should be secured. Generally the first cross combines the qualities that are the strongest and best established in the parent stock. For instance, if we cross a Jersey bull with a cow of common, hardy stock, we may have crosses that are good milkers and at the same time possess the hardiness and strength of the common stock. Occasionally some are even more profitable than the pure Jersey stock, as they can be fed successfully on much cheaper food. But we cannot perpetuate these qualities. If we use these first crosses for breeders, the next generations will show all sorts of variations and combinations, some of the individuals exhibiting only the defects of the parent stocks instead of their qualities. And the same thing would occur with bees. Yet by preserving and breeding all the time from the best, good results can be obtained.

The second method would be to start with the best stock obtainable and breed exclusively from it, selecting always the best queens; that is my preference. An objection to it is that when in-breeding or breeding from the same stock indefinitely, there is a risk of the stock deteriorating; the faculty of reproduction being the one most likely to suffer. In support of that opinion, Darwin's theory has been quoted that in the natural state in-breeding is rather the exception, that animals cross between far-related parents, and that in the majority of cases plants are fecundated by pollen brought from other plants by insects or by the wind. I don't think this argument has any value. In-breeding in some classes of plants or animals is the rule instead of the exception. But suppose the theory always correct. It is easy to conceive that a defect might be perpetuated by in-breeding and eventually bring the extinction of the race. But such need not be the case when man is in control, because the defectious individuals can be eliminated.

There are some cases in which close in-breeding has brought in a weakness of reproduction. But such cases exist only in cattle and swine raised exclusively for fattening purposes. Nothing of the sort has ever occurred in cattle bred for milk or in horses. The weakness must be due to the excessive disposition to storing fat. This could be expected if we consider that such a disposition is in some respects a kind of diseased condition.

Another thing must be mentioned, the influence of the sexes. In the higher animals the concurrence of both sexes is needed to insure reproduction. The offspring partakes of the characters of both. Many farmers dispute that statement and insist that the male has more influence than the female. But the authorities say that if the male of a pure race has more influence it is due, not to his sex, but to the fact that his characteristics are stronger, or to use the proper word, better "fixed." What does the word fixed mean? Let us take the Jersey cattle. From away back, only calves showing the regular standard color have been used for reproduction. So that color has become fixed and now is invariably reproduced. But if calves of any and all colors had been used, the color would not have become fixed, and we would have Jersey cattle of all colors.

When we come to bees we are confronted by altogether different conditions. The drones are produced without the concurrence of the male element, and therefore reproduce the characteristics of their mothers. The male element is strong enough to invariably change the sex of the eggs, and for that reason we might expect it to predominate in the workers, and it so happens. When Doolittle began to keep Italian bees, he had the only ones in his locality. At the beginning what crosses occurred were necessarily first crosses. He tells us that the workers from a black queen crossed to an Italian drone showed the characteristic of the Italian race to a very marked extent. On the other hand, the hybrids from an Italian queen mated to a black drone possessed the traits of the black bees, almost exclusively, some of them, their temper for instance, even exaggerated. The experiments made by Frank Benton, published in *Gleanings* some eight or ten years ago, gave the same results.

Such being the case it is very important to have drones of good stock. We cannot control the individual drones, and this is not necessary, for there is probably very little difference between the drones of the same colony. What is necessary is to have plenty of drones from our selected colonies and suppress the others as completely as possible.

We come back now to the all important question: What constitutes a good queen? Evidently the one whose workers gather the most honey or give us the most surplus. It does not matter to what their superiority is due. It may be long tongues, it may be longevity, it may be something else. So far as practical or rather financial results are concerned, we want to breed from queens whose colonies have given us the best returns.

Still a few other conditions have to be met; gentleness for instance; a disposition to cling to the combs instead of falling off at the least jar; color for those who care for it. I prefer the lightest, but this is with me a question of locality. All the bees around me are black hybrids, or very dark Italians. The difference of color enables me to detect mismating easily.

Two other considerations are very important to the comb-honey producers but not so much to the extracted-honey

men. One of them is the disposition to swarm. It can be easily controlled when working for extracted honey if the directions given in Langstroth revised are followed, including the use of a hive of the proper size. But it is not so with the comb-honey worker. However, as the colonies which refrain from swarming are usually those that give the most surplus, the selection of the best will automatically help some in that direction.

The other is the capping of the cells white. A good deal depends upon the flow, the temperature and other conditions, but after all is considered, the fact remains that some colonies cap their honey much whiter than others. That has some importance with the comb-honey producers, for the honey capped white outsells the other. Needless to say that for the extracted honey apiarists, the color of the capping does not matter at all.

Knoxville, Tenn.

### Drone and Worker Comb in a Hive

BY DR. C. C. MILLER.

**H**OWEVER much we admire the work of the bees under ordinary conditions, their exhibition of skill and intelligence under unusual conditions demands still more our admiration.

A piece of honey comb is a sample of exquisite workmanship, whether it be worker-comb or drone-comb, but the manner of changing from one to the other is a feat of engineering to which human skill can hardly attain. How rapidly the change is made from worker-cells to drone-cells, and how few irregular cells, or accommodation cells, between one kind and the other!

Bees build their combs so that there is plenty of space between them for them to pass over the two opposing surfaces without any interference. Between two worker-combs this space will be about half an inch. But sometimes a meddling beekeeper interferes with their arrangement, and two opposing surfaces are placed too close together. If this be done at a time when the cells contain young larvae, the brood goes on to completion, but the bees are necessarily dwarfed. The bees, however, take good care that this shall not happen again. Rather than to have the young bees dwarfed in both combs, they decide that the youngsters in one comb shall have plenty of room, and they proceed deliberately to gnaw down to the septum the cells of the opposing side.

The up-to-date beekeeper considers it the proper thing to suppress all or nearly all drone comb in the brood-nest, but he has not yet trained his bees to understand that this is a desirable thing, and so instead of thinking that a colony or two can rear drones enough for the whole apiary, each colony, at certain times proceeds, so far as it is able, to rear as many drones as it would if not another colony were within a hundred miles.

If drone-comb be lacking in the brood-nest, the bees seem desperate in



their efforts to rear drone-brood by hook or by crook. Indeed, some insist that they go so far as to change worker-comb into drone-comb. To do this, however, by gnawing the worker-cells down to the septum, and then upon the unchanged septum to build cells of the larger diameter, is a physical impossibility. For if the septum be a plane, and the walls of the cells perpendicular to it, then those walls must be parallel to each other, and the cells no wider at mouth than at bottom. The only exception to this is when the septum is not a plane, but is curved. In that case the bees not only can, but they must, build cells wider at the mouth than at the bottom. But in order that the cells be enlarged enough to serve as drone-cells, the septum must be very much curved. Such cases are very rare, and the accident of such curving can hardly allow the bees the credit of design in changing from worker-cells to drone-cells. In fact, there really is no *change*, for even if the bees should gnaw the cells down to the base, they would only build again just what was there before.

Moreover, if it were possible for the bees to change worker-comb to drone-comb, examples of it should be common, considering the efforts the bees at times make to have drone-brood; yet plenty of beekeepers of many years experience and observation say they have never observed such a case. When drone-brood is desired, and no drone-comb is found in the brood-nest, the beekeeper not infrequently finds a patch of drone-brood outside the brood-nest, if drone-comb happens to be there. When the brood-chamber is entirely filled with worker-comb, and a super of sections is on the hive, if it happens that a section is not entirely filled with worker-foundation, the bees are quite sure to fill the vacancy with drone-comb, and the queen will come up and lay eggs in it; and if she is prevented from going up by an excluder, the bees will often refrain from storing honey in the drone-cells, leaving them vacant for the expected coming of the queen. Why all this roundabout work? If bees can change worker-comb to drone-comb, why not take the simpler plan of changing a sufficient amount and having it right where it is wanted, in the center of the brood nest?

But bees can and do change drone-comb to worker-comb. Left to their own devices the bees of a swarm build more or less drone-comb. But after a young queen has been reared in the hive and begun laying, drones are neither needed nor wanted, and a large patch of drone-comb in the middle of the brood-nest seems to be only in the way. Why not rear worker-brood in it? But the queen either will not or cannot lay worker-eggs in drone-cells. So the bees proceed to change the drone-cells to worker-cells, at least so far as to make the mouths of the cells of worker size, which seems to answer every purpose. Sometimes a beginner, or even one not a beginner, is puzzled to know what it means that so often he meets with patches of what appear to be drone-cells with very thick margins. The margins are not so thick as they appear, but the cells are partly sealed over so as to reduce the mouth to the proper size for worker-brood.

From these cells will emerge in due time young workers that are normal in every respect. The change of drone to worker-comb is much more common than the unobservant beekeeper is likely to think.

Marengo, Ill.

## No. 18.—The Honey-Producing Plants

BY FRANK C. PELLETT.

(Photographs by the author.)

THE wild cherries are widely distributed over the North American continent, and beekeepers who live in timbered sections may expect to find one or more species within reach. The photographs shown herewith, Figs. 83, 84, are of the wild black cherry, *Prunus serotina*, which is a large tree with reddish brown branches and oblong taper pointed leaves. This tree is common in the woods from Newfoundland, Ontario and Manitoba, south to Florida and Arizona. There is a smaller tree with very similar flowers, the choke cherry, *P. virginiana*, to be found over much the same territory, while the western choke cherry, or western wild cherry, *P. demissa*, ranges from Dakota, Kansas and New Mexico west to California and British Columbia.

The larger tree, *P. serotina*, is also said to occur in Mexico, Peru and Columbia. There is also a varietal form known as the mountain black cherry found in southwestern Virginia, Georgia and Alabama. It is found on the open rocky summits of the higher altitudes. This form is a tree 25 to 35 feet high with very rough bark and drooping branches. The wild red cherry or pigeon cherry, *P. Pennsylvanica*, is common in the northeastern States and secretes nectar freely.

Both leaves and seeds of all these forms are poisonous, although the fruit is edible. There seem to be well authenticated cases of poisoning of cattle

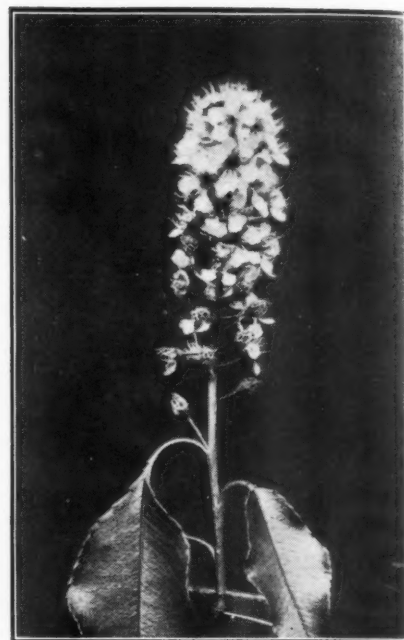


FIG. 84.—SINGLE FLOWER CLUSTER OF WILD CHERRY

from eating the leaves, and of children dying from swallowing the seeds. Prof. Pammel, in his book of poisonous plants, gives an extended description of the chemical action in such cases. The poisonous property of all species of cherry leaves, according to authorities quoted there, is due to prussic acid. The poison does not exist as such in the growing plant, but by the action of moisture and a vegetable ferment which exists in the plant a complicated chemical reaction takes place when the leaves are separated from the stem. Wild cherry bark is used to some extent in medicine.

Wild cherries are not often reported



FIG. 83.—BLOSSOMS AND LEAVES OF WILD BLACK CHERRY



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as valuable sources of nectar. Richter lists the western choke cherry as a source of honey in California, and Lovell mentions the wild red cherry in the eastern States. The writer has a sample of this honey sent to him from the apiary of W. S. Pangburn, of Jones Co., Iowa, having a distinct cherry taste and bright yellow color. After 2 years it shows no trace of granulation although subject to all changes of temperature of Iowa climate both summer and winter. All but few of the samples of honey in the collection have candied under similar conditions.

Since in northern States the bloom comes after the blossoms have fallen from the domestic fruits and just before the opening of white clover, it should prove of considerable value where present in quantity.

Atlantic, Iowa.

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### A Beesting Victim's Idea of a Bee-Hat

BY DR. G. R. RICHARDSON.

HAVING been told times without number about persons whom bees would not sting under any circumstances, and how grandfather handled bees with his bare hands and never was stung, and that such foolishness as wearing a veil was never thought of, I began to wonder if some of these stories were not on a par with the oft-repeated assertion that father had double teeth all around and was in the habit of cracking hickory nuts and biting cut nails in two. I wondered what a double tooth looked like and what sized nails they had when father was a young man, and also why it is that we no longer have those deep snows that covered the fences out of sight, and finally concluded that most of these stories were told by men who had been eating artificial comb honey and didn't know it.

There is a difference in persons getting stung, and it is not all in knowing how to handle bees, nor is it all in the kind of bees, nor the time of day or state of the honey flow; although all these factors must be understood and taken into consideration if the full enjoyment is to be derived from bee-keeping.

I have been laughed at for being afraid of bees, and have been told how they should have been handled, and have had the satisfaction of seeing the bragger with both eyes swollen shut, and so those stories that appear from time to time in the bee-papers in which the smarty gets bitten appeal to me.

I was not sure at the time I received my near-lethal dose whether it was a heart stroke, a snake bite or bee stings, but remembered after it was all over, and in calmer moments, of feeling two stings on my left ankle and also of seeing the bees.

It was a sultry July day and we were going over our bees to see that everything was right. We were standing, one on each side of a hive which was raised up on blocks, as it was in the height of the flow. We were busy. I knew that I had been stung, but did not pay much attention to it; in fact, not as much as usual. I always remove

the sting as quickly as possible, having found that it does not swell so badly if removed at once, and that alone may account for the unusual effect that day.

First I noticed a tingling sensation in both feet, but thought it imagination until my hands also began to feel as if asleep, and only then I awoke to the fact that something unusual was happening, and told my wife that I would have to stop. By the time we reached the house I began to see high lights, and in 15 minutes that was all I could see, as both eyes were closed and my throat and tongue were so thick I could speak with difficulty.

Even then I was not alarmed until I felt for my pulse, and getting no return I asked my wife to put her ear down and see if it had really stopped. She of course told me that it was still beating, but by that time I was too sick to joke any longer, and although I had never fainted in my life, I thought that my time for it had come. I deny that I lost consciousness, but will have to admit that at one time I was not far from it. My wife made strong coffee, but I was too sick to drink it, and thinking of some aspirin we had in the house, she gave me 15 grains. After keeping quiet for some time I felt enough better to drink a cup of coffee, and then the worst was over. I was so full of fire that I did not sleep much the first part of the night, but awoke the next morning fully conscious that I had missed a meal. It did not take me long to make up that, and aside from a swollen ankle I was none the worse for my experience.

The strange part of it was that I had

been stung over a dozen times on the same ankle only the week before, and it had not inconvenienced me in the least. The effect of these two stings was certainly out of all proportion to the size of the dose I received.

I know of no reason for this unusual effect unless it was because of being overheated, and yet I have been hotter than I seemed to be at this time. It may have been that, my circulation being more rapid, the poison got action all at once instead of gradually being distributed, and then again there may have been a difference in the virulence of the poison at this particular part of the honey flow.

At any rate, I have concluded to get along without a repetition of this kind of experimentation in the future and with this end in view have put together a uniform which is in part a diving suit, part Ideal, part Coggshall, and part Globe. The headpiece of wire-cloth attached to a discarded office coat of duck, which has been sewed together down the front and cut out at the neck so it is easier to get into. With gauntlet gloves and high shoes, which are laced up outside my trousers' legs, I imagine that if any bee gets at me now it will have to go through, and there is no place it can do that as I sewed it myself and waxed the thread. While I was sewing I was thinking of what a time I had, and would go over it again if it looked at all weak at any place.

I own up that I do get sort of heated up when I wear it for any great length of time, but did any one ever work long at that time of year when there is the most to be done with bees who



THE RICHARDSON BEE-PROOF SUIT

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didn't get sort of thawed out? The part of the outfit that I particularly pride myself on is the ventilating apparatus which holds the top of the hat away from my head and at the same time keeps the whole thing from falling around, as a hat that is too large will do, just at the wrong time. It is made of half-inch strips of galvanized iron riveted into the shape and size of a hat band and is covered with outing cloth which makes it more comfortable for the head.

I made two of these uniforms so that if anything happened to one I would have another to put on; but my wife says that I made two because I was afraid the bees would gnaw a hole through the wirecloth and then I would have to stay in the house. In the picture, I am holding the headpiece higher than it is in actual use, so as to show better how it is made, but when down where it should be it is not so top

the spring, pasture lands covered with white clover, dandelion, hound's-tongue (*Cynoglossum officinale*), which has even the vervain on the run, together with persicaria and the swamp flowers, we have all that could be asked for in the way of fall feed to winter on, and a delightful place to spend the hot months of summer.

Princeton, Ill.

### The Strittmatter House Apiary

BY F. J. STRITTMATTER.

**T**HE following description is received from F. J. Strittmatter, of Ebensburg, Pa., concerning the Carrolltown house apiary mentioned on page 383, November, 1914, and page 94, March, 1915, of the Bee Journal. This is in reply to the request of Mr. E. G. Carr

and others:

Bill of lumber, etc., used in our latest house, apiary, 12x24 feet, 2 stories, containing 62 hives for bees, built in solid. Bill does not include any supers or brood-frames, as we had these with our outside equipment.

Forty-two studding, 2x4—12 feet. 26 rafters, 2x4—9 feet. 550 lineal feet 2x4, any length, for sills, plates and odds. 14 joists 2x8—12 feet. 60 lineal feet 2x6, surfaced one side for window sills. 550 hemlock boards for sheeting, etc. 500 feet of flooring. 1200 feet of siding. 150 lineal feet hemlock boards, 10-inch, surfaced two sides, for roof boards over entrances. 150 lineal feet hemlock boards, 6 inch, surfaced two sides, for alighting-boards under entrances. 120 lineal feet hemlock boards, 8-inch, surfaced two sides for brackets to fasten alighting-boards. 550 lineal feet hemlock boards, 9½-inch, surfaced one side for sides and ends of hives. 150 lineal feet hemlock boards, 6-inch, surfaced one side for top boards or edge of hives. 700 lineal feet hemlock boards, 5-inch, surfaced one side for top boards and window frames and corner strips. 150 lineal feet of roofing lath for bracing and odds. 4 rolls of roofing. 900 square feet of red sheeting paper. 900 square feet of tarred sheeting paper. 15 single light windows with 16x30 inch glass. 1 door, hinges and lock.

We have concrete wall and floor in bottom. The wall is built about a foot higher than the floor, and a frame is placed on the level with the top of the wall, about 2 feet wide, on which a smooth floor is laid which forms the bottoms of the hives in the lower story. We have the hives arranged with the frames running parallel with the sides of the building, making the entrance in side of the hive. This makes it more convenient to handle frames and supers.

The hives upstairs are placed on the regular floor. We use spouting on building to keep the water out of the way in times of rain. We have ample room, for all extra supplies needed, in the middle of the building without interfering with the work with the bees.



PART OF THE RICHARDSON APIARY

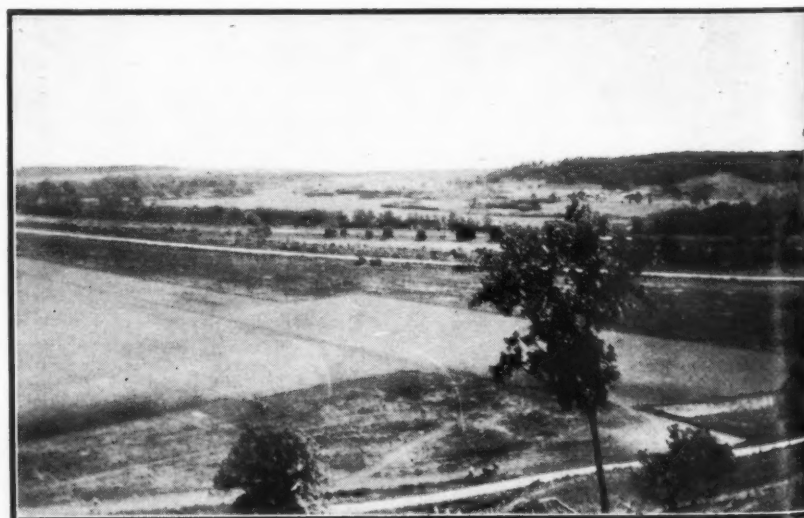
heavy as it looks, and the muslin apron does not come up so as to obstruct the view.

My wife laughs at my pet uniform, but when anything really serious, such as transferring combs from odd sized frames, happens along, she takes in the common sense outfit readily enough.

Our apiary is situated on the top of a hill the height of which may be guessed at by looking at the team of horses at the bottom of the picture, and also by knowing that there are 90 acres in the field of corn in which the team is plowing. The view from this hilltop is certainly grand, and one can scarcely imagine that the picture was taken in the prairie State of Illinois, between locks 4 and 5 on the famous Hennepin canal.

The town of Hennepin on a clear day may be seen in the middle distance, also the valleys of Big Bureau and East Bureau creeks, and then on out to the heavily timbered overflowed lands of the Illinois river.

Sweet clover is abundant, and with plenty of willows to furnish pollen in



VIEW FROM HILLTOP, LOOKING TOWARD HENNEPIN AND THE ILLINOIS RIVER—AT THE RICHARDSON APIARY



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The cost of labor included building a fence on one side of the apiary ground and making a road about 300 feet.

Our hives in the house apiaries are made to take the regular Hoffman brood frames the same as we used outside and to take the standard factory 10-frame supers for either comb or extracted honey.

The lumber for this building cost us about \$75 at the mill, and the other material including windows, door, paint, roofing, nails, cement for foundation and spouting, etc., cost about \$50, making the total cost of material \$125, the labor, counting hired help at cost, and my own time, \$3.00 per day, cost \$145, including about \$20 paid for boarding our men part of the time near the job, and we figured \$30 for gasoline and wear and tear on automobile, looking after the job and taking our crew back and forth nearly every day, as this building is six miles from home. The above makes a total cost of \$300. We sent to a mail order house for the roofing, windows, door, and such things, and saving some money on these.

We used two kinds of sheeting paper; we put this on just ahead of the weather boarding, putting on next the studding, the heavy, regular red sheeting paper and on this the tarred sheeting; the idea being to have the tarred paper make it more secure against mice or other vermin chewing through, and the red paper, lighter in color, to make the building as light as possible inside. Of course, you could use any light colored paper for this.

It is important to have corners cut out of the window lights at all four corners, so bees may get out when you are working with them. We also have galvanized screens on the windows outside, spaced out from facing at top and extending up a little further so bees can crawl up and out and to prevent them getting back in, but these interfere some with their getting out on a cool day, and can be omitted if you are careful not to leave any honey exposed inside when there is no flow.

We had enough extra lumber in about all sizes for stair risers, treads and scaffolding, so this could be left up for the painters. Studdings are placed 24 inches from center to center, and one hive for each space. The windows are just the right width so frames can be set in without cutting out any studding. Entrances are painted different colors so the bees can the better find their own places.

We have all our bees in house apiaries now and would not like to go back to the outside apiaries for several reasons. We find in the first place we can get more work done in the house apiary on account of being able to have things handier as well as more independent of weather. We use all 10-frame hives, having same built in solid in the last two house apiaries we built; while in the first one we put in hives previously nailed up. We run for extracted honey almost exclusively, producing a little comb honey at the home apiary only.

We go over all colonies in the spring as soon as the weather permits to see that all queens are clipped as well as to clean out any dead bees or other refuse that may be in any of them, and note

general conditions. We make a more thorough examination at this time than at any other time of the year. In fact, many colonies may not have their brood-nest disturbed again until fall unless we have reason to suspect disease. Of course, if a colony does not progress properly it is examined again to ascertain the trouble. We are careful to place supers on all hives before they seem to be ready for swarming.

I figure that as to cost, while we had to make an extra investment to change to house apiaries, the expense in case of starting a new apiary is very little more for a house apiary than that for chaff hives and a necessary supply house. But of course you would not want to build a house apiary unless you were satisfied that you would want to keep the same location for a number of years and could buy the ground reasonable.

Ebensburg, Pa.

## The Greening Method of Swarm Prevention

BY H. B. TURRELL.

IN the American Bee Journal for September, 1914, Mr. C. F. Greening has an article in which he tells how he prevents swarming in his apiary. His method as set forth in his article is so simple and so easily followed that one would expect it to be adopted by all beekeepers, provided it works out according to his statement.

We rather expected to see some comment on this method of swarm control, in later issues of the Bee Journal, but so far none have appeared. Would it be too much to ask that you submit the article in question to some of your regular contributors, and ask them to tell us what they think of it? It seems to me, like a great many other things, we read of in bee-keeping "important if true."

For my part, I believe I should rather see more articles such as Mr. Greening contributed than so much about wintering and foulbrood. Wintering is a subject of no especial interest in our latitude, especially cellar wintering, and as this subject, as well as bee diseases is fully covered in the various books on apiculture, and by publications of the State and national governments, it seems that those wishing information concerning such subjects might well be directed to the proper sources of information, and to avoid the endless repetition which we find in the bee journals.

To get back to Mr. Greening, he states that his crop ran to from 150 to 200 pounds per colony. Such a yield must have required good management in addition to any non-swarming method he may have used, *n'est-ce pas?* Wheatland, Ind.

[The Greening method was commented upon in several numbers of the "Questions and Answers Department," especially in the number for May, 1915, page 171. Mr. Greening was a successful man, but perhaps a little emphatic. We believe his method is excellent in the production of extracted honey,

though we doubt much its advisability in comb-honey production. We do not like his method of making artificial swarms for the reasons given in that May number.

As to the value of the Greening method, in extracted honey production, we would be glad to hear from those who tried it.

Our correspondent wants us to "avoid endless repetition." This we aim to do. Yet if we were to give only new things, we would have to be constantly perusing the past years of the Journal; for it is astonishing to find how many of the so-called new methods have been published at one time or another and forgotten. Some things bear repeating on account of their value. Many good things, worthy of putting in practice, are read and forgotten.

Mr. Greening died July 1, 1915, and his death was recorded in our October number, page 335.—EDITOR.]

## Hiving Bees from Combless Packages—A Suggestion

BY KENNETH HAWKINS.

TRouble in keeping many of the bees in packages from going into the air, if they are shaken at once into hives and not left to go down per usual directions, has led me to a new plan, at least new to me. I don't like the plan of letting the bees go down to brood or combs after opening packages and laying them above in a super, as too often they fail to do so in reasonable time. Trouble that way, led me to think of wetting the bees with a sprinkler as in making up queen-mating nuclei, to keep them from flying, and now I do it with all packages, just before opening cages. They never fly, and are at once where they are wanted without delay.

Care must be used not to use too much water, and if the plan has not been already given to beekeepers, I would be glad to see it published, for it is a bee saver, time saver, and a sure method.

Plainfield, Ill.

## Yield of Honey in Southern California

BY J. E. PLEASANTS.

SOUTHERN California's honey yield will be less than half a crop this year. The honey is of good quality, and prices, so far as can be ascertained to date, are considerably in advance of last season. Buyers are in the field trying to make contracts for honey. So far, little has been sold; 6½ cents per pound is offered f. o. b. shipping points for white sage, 6½ for orange honey, and 5 cents for amber.

We have had very unusual climatic conditions. Our season might be sized up as a flood followed by a dry year. It



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rained almost the entire month of January. Much damage was done throughout the State by floods. There was considerable rain in February. The ground was packed by flood waters standing for a considerable length of time. This was followed by an intensely dry spring, with considerable wind, both hot and cold. There was practically no spring rain, nights cold, days warm and dry. This made a very unfavorable condition for nectar flow and for crops generally. Many other crops are light here, some almost a failure.

It is the first season I have ever seen here, during a period of perhaps 40 years, where so much rain has produced so little honey. But, after all, the distribution of a season's rainfall counts even more than the precipitation.

The season has also proven a bad one for all bee diseases. We have European foulbrood a plenty. Sacbrood and paralysis are unusually prevalent. The combination of diseases is keeping us busy here.

Orange, Calif.

honey' is intelligible and not confounded with something else.' With that way of deciding I'm afraid there would be trouble. One might think of some way in which there would be confounding and another might not; so one would use hyphen and the other not. 'He proceeded to comb honey out of his hair, and when he did comb honey he found it was not comb honey but extracted.' That's strained of course (although not strained honey), but it's simpler and better to follow the general rule, that when two nouns are joined together a hyphen be used, or else run together the two words as one."

### MISCELLANEOUS



### NEWS ITEMS

**A Farmer's Beekeepers' Club.**—Cooperation is everywhere, but it remains with Bruce Anderson to be the first County Agent to form a beekeepers' club in order to foster beekeeping, and they need it in North Carolina where Mr. Anderson is working. In fact, we never think of North Carolina as much of a bee State, although in reality it is among the first for the number of colonies of bees. So far nearly all the bees have been left in box-hives. But Bruce Anderson isn't the kind of a fellow who is going to be content with conditions as they are now. He wants improvement. In order to join his county beekeepers' club the beekeeper has to agree to 17 different rules. These are as follows:

1. Each member must have one or more colonies of bees in frame hives, a smoker and veil.
2. Study bulletins and literature on beekeeping.
3. Subscribe to a reliable bee journal.
4. Attend meetings of beekeepers.
5. Watch the brood-nest for loss of queen, disease and time to put on supers.
6. Have two or more supers for each colony, spring count.
7. Prevent swarming by giving colonies plenty storage room for surplus honey, laying room for queen and ventilation.
8. Requeen colonies after honey flow every two years from the best honey-gathering colonies.
9. Secure Italians from breeders of high honey-yielding bees.
10. Provide each colony in October with 25 pounds or more of honey or syrup, if they have not that much.
11. Give bees plenty of protection in winter from the cold and winds.
12. Keep records of colonies, cost of running apiary and honey yield for each colony.
13. Make report to County Agent at the end of the season.
14. Cooperate with other members in buying supplies and marketing honey.
15. Put on the market only good honey well graded.

16. Follow instructions of the club leader.

17. Make an exhibit of bees and of honey at the Winston-Salem Fair, 1916.

Some of these days North Carolina will be considered more seriously as a beekeeping State. The South is diversifying.

**Honey Prices in Switzerland.**—A peculiar statement comes from Consul General F. B. Keene, of Zurich, Switzerland. He reports that, out of 29 articles of food and household consumption, all have increased in price since the beginning of the war, from 3 to 175 percent, except one, honey. According to this authority honey in Switzerland has decreased in price, from 77.2 centimes per kilo, to 73.3 centimes (\$6.75 per cwt. to \$6.41). This is for extracted honey, of course, as they produce no other.

**A Suggestion.**—In reply to your request for suggestions, I would like to hear of the experience of successful wax-producers.

Chico, Calif.

R. DEIMER.

We suppose our enquirer wants to hear of the cost of wax, to the bees. The honey consumed for wax-production has been estimated all the way from one pound to 30 pounds for each pound of wax, with the majority putting it at from 7 to 12 pounds. Several producers have announced their intention to make a practical test by feeding honey to produce combs. Have any positive results been attained?

**Hyphen Between Beekeeping Words.**—To a short criticism of the newly hyphenated words decided upon by the Phillips-Root-Miller-Dadant agreement Dr. Miller replies as follows:

"You say 'I also feel like objecting to 'comb-honey' as long as 'comb

### Beekeeping Industry of New Zealand.

—Honeybees were first introduced into New Zealand in 1839, and in 1880 and 1882 the Italian, Cyprian, and other bees were brought in. Modern methods of beekeeping were introduced in 1878, principally from the United States. The industry is now supported by New Zealand laws and regulations. In 1906 the government established an experimental apiary, where between 40 and 50 students are trained annually.

According to law no common box-hives are allowed in this dominion, the hive in most general use being the American Langstroth. It would seem that here should be a fine opening for beekeeping supplies, and it would seem wise for American makers of such wares to get in touch with the beekeeping associations.

Since 1907 disease among bees has been kept under control, and the business in general is prosperous, with the result that in 1915 there were in the dominion 11,200 beekeepers who owned 72,340 hives, with an estimated production valued at \$250,000. It is expected the output will be doubled within the next three or four years.

During the year 224,000 pounds of honey were exported to England, and it is anticipated that this trade will be more than doubled during 1916. All honey is inspected and graded by government experts before it is allowed to be exported.

CON. GEN. ALFRED A. WINSLOW.  
Auckland, New Zealand.

**A Massachusetts Meeting.**—A most successful meeting of the Hampshire, Hampden, Franklin Beekeepers' Association was held in the Board of Trade rooms, Springfield, on May 13. This, the annual meeting, was postponed from March 16, when it was to have been held in Amherst in conjunction with the beekeeping meetings during Farmers' Week.

Much the same program was followed. The election of officers resulted as follows: President, O. M. Smith; Vice-President, A. C. Andrews, Rev. D. D. Gorton, and L. R. Smith; Secretary-Treasurer, Burton N. Gates, Amherst. Unanimous vote re-established the annual fee to 50 cents per annum.

Among the papers read was the annual address of the president, O. M. Smith, who presented numerous "Timely Suggestions to Beekeepers." By way of a report of progress for the committee on honey labels and standard packages, Dr. B. N. Gates, chairman, explained what constituted an attractive label

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Mention was also made of the standardization of honey containers, particularly small glass containers. After the report, discussion followed wherein it was particularly emphasized that beekeepers give more and more attention to supplying their customers 16 ounces for a pound package and 8 ounces for a half pound package. It is being considered by the association to adopt a label which the members of the association may use. This attached to their products indicates their affiliation with the local society, and is thought to be of advantage in selling local products.

A most interesting address followed by A. W. Yates, of Hartford, Conn., on the "Spring Handling of Bees."

A committee consisting of the president as chairman, the three vice-presidents, and the secretary-treasurer was appointed to wait upon the managers of the agricultural fairs for the purpose of obtaining proper recognition of beekeepers for displays of beekeeping products at these fairs. It was left to the executive committee and the secretary particularly to arrange for the society to hear Mr. C. P. Dadant, of Hamilton, Ill., when he visits the East next August. This will constitute the field meeting of the association.

The meeting adjourned shortly before 5:00 o'clock, p.m., there having been a good attendance.

B. N. GATES, Sec.

**Michigan Fairs and Premiums.**—The West Michigan State Fair at Grand Rapids has increased the premium list in the Apiarian Department from \$60 in 1915 to \$600 in 1916. The Michigan State Fair at Detroit has increased the premium list from \$132 in 1915 to \$575 in 1916. This has been the result of the Michigan State Beekeepers' Cooperation and many members supporting the special committee in this work. This illustrates just one instance of how beekeepers' associations can do much effective work.

Not content with this, however, a special committee of the association after a large amount of work has formulated a model list of premiums for fairs together with a table of standards by which such premiums are to be awarded. This table has been adopted by both the Michigan Fair Associations. Mr. E. D. Townsend is to be the judge at the State Fair which is to be held Sept. 4 to 13.

We urge all Michigan beekeepers to write to the secretary of their association, Mr. F. E. Millen at East Lansing. He will be glad to put you in touch with the proper fair authorities. Every live beekeeper should be an exhibitor. It is not only a recreation, but it is the very best way of advertising your product.

**Chicago Field Meet.**—The field meet of the Chicago-Northwestern Beekeepers' Association will be held at the

home of W. W. Faulkner, 3000 North Cicero Ave., Chicago, Ill., Saturday, July 15.

Many things combine to make this an ideal place for a meeting of beekeepers. Besides being entertained by one of the most hospitable families in Illinois, we will meet Mr. Faulkner, Sr., who is probably the oldest and one of the most successful beekeepers in the United States. Mr. Faulkner, Sr., is in his 100th year, and was born among the bees in Scotland. The family recently sold a large portion of their beehive range for over \$260,000. They still retain the buildings and ten acres of the best part of the farm, worth another \$50,000.

The house stands on a ridge that was once the shore of Lake Chicago, which at one time covered the entire site of the present city. It can be reached by trolley from anywhere in the city for a 5-cent fare. A basket picnic will be served by the queens that do not swarm, which we hope will attract enough drones to furnish us with an intellectual feast as well.

**Bumblebees Wanted by Dr. Burton N. Gates.**—I take pleasure in thanking the beekeepers of the country who so kindly sent me numerous specimens, upwards of a hundred, in response to my appeal for bumblebees taken in or about beehives last year. Although this large collection has been of great value to the student, further specimens are needed, particularly from the West and South.

I hope, therefore, that the beekeepers will mail me in a secure package either bumblebees or other insects caught robbing hives or taken dead from inside of hives. They should be prepared for shipment in a strong box and bear the name and address of the sender in order that due credit may be given. All kindly write me stating the circumstances and date of the capture. These notes which I am receiving from the beekeepers are exceedingly interesting and valuable.

BURTON N. GATES.

Amherst, Mass.

**Shipping Bees to Canada.**—The Canadian Beekeeper sends us the following information, which will prove of use to all shippers of bees from the United States as well as to the Canadian purchasers:

"A number of bee importers have been complaining about their shipments of bees being delayed by the Customs Department. There is no duty on bees and queens coming into Canada, but special attention should be given to the Customs requirements."

Mr. Morley Pettit, Government Apiarist for the Province of Ontario, writes Canadian Beekeeper as follows:

"I have had some rather serious complaints from beekeepers importing bees from the southern States, stating that their bees had been delayed by the Customs authorities, both at the border and at the Port of Entry. I took this matter up with the Customs Department, and in reply have the statement 'That if the importers would take the

matter up with the collectors at the various ports and produce the invoices and declarations promptly, or even before the arrival of the shipments in question, there should be no delay in so far as the Customs is concerned.

1. "Invoices should be made out in duplicate.

2. "They should contain two entries of the cost of the goods, fair market value as sold for home consumption at the time shipped, and selling price to the purchaser in Canada.

3. "They should contain place and date and signature at the bottom.

4. "The Certificate Form M' should be either typewritten or printed on the lower part or back of the invoice."

Blank copies of invoices may be obtained by Canadian importers from the different Custom Houses.

## TELLING THE BEES

Among the old superstitions there was one which required that the bees be told and put in mourning when some one died in the family. Otherwise they dwindled and left. The following poem on this subject by one of the most celebrated American writers of the XIXth century is probably known to only a few of our younger readers:

Here is the place; right over the hill,  
Runs the path I took  
You can see the gap in the old wall still,  
And the stepping-stones in the shallow  
brook.

There is the house, with the gate red-barred,  
And the poplars tall.  
And the barn's brown length and the cattle  
yard,  
And the white horns tossing above the wall.

There are the beehives ranged in the sun;  
And down by the brink  
Of the brook are her pure flowers, weed-  
o'errun;  
Pansy and daffodil, rose and pink.

A year has gone, as the tortoise goes,  
Heavy and slow;  
And the same rose blows and the same sun  
glows,  
And the same brook sings of a year ago.

There's the same sweet-clover smell in the  
breeze,  
And the June sun warm  
Tangles his wings of fire in the trees,  
Setting, as then, over Fernside farm.

I mind me how, with a lover's care,  
From my Sunday coat  
I brushed off the burrs and smoothed my  
hair,  
And cooled at the brookside my brow and  
throat.

Since we parted, a month had passed,  
To love, a year;  
Down through the beeches I looked at last,  
On the little red gate and the well-sweep  
near.

I can see it all now, the slantwise rain  
Of light through the leaves;  
The sundown's blaze on her window pane—  
The blooms of her roses under the eaves.

Just the same as a month before—  
The house and the trees,  
The barn's brown gable, the vine by the door;  
Nothing changed but the hives of bees.

Before them, under the garden wall,  
Forward and back,  
Went drearily singing the chore-girl small,  
Draping each hive with a shred of black.

Trembling, I listened; the Summer sun  
Had the chill of snow;  
For I knew she was telling the bees of one  
Gone on the journey we all must go!



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Then I said to myself: "My Mary weeps  
For the dead today;  
Haply her blind old grandsire sleeps  
The fret and pain of his age away."

But her dog whined low; on the doorway  
sill,

With his cane to his chin,  
The old man sat, and the chore-girl still  
Sung to the bees stealing out and in.

And the song she was singing ever since  
In my ear sounds on:  
"Stay at home, pretty bees, fly not hence,  
Mistress Mary is dead and gone."

—John Greenleaf Whittier

## A Summer Meeting of Beekeepers.

In accordance with the action of the beekeepers at the summer meeting held at Hamilton, Illinois last year, the committee appointed has arranged for another meeting to be held at Dubuque, Iowa, on Aug. 1 and 2. It is to be hoped that a permanent organization of the beekeepers of the upper Mississippi valley may be effected, and that these valuable meetings may be continued. The Commercial Club of Dubuque has promised royal entertainment for all who attend. The meetings

will be held in beautiful Union Park, one of the beauty spots along the Mississippi. If the weather is inclement the meetings will be held in the park pavilion.

These meetings are of vital importance to the beekeepers as they help to attract public attention to the use of honey, in addition to the value of information gained by the personal contact of honey producers. Dubuque is a city of several thousand population and a honey market that has hardly been touched. If more city meetings were held so as to bring the use of honey before the general public at home it would not be long before the demand for honey would be doubled and trebled.

Every beekeeper who can possibly make arrangements to attend this meeting will gain much of value besides having a royal good time. Come, bring your wives and families and help make this one of the best meetings ever held.

N. E. FRANCE,  
A. L. KILDOW,  
C. E. BARTHOLOMEW,  
Committee.

the frames, the rods to have a lever handle at one end, and by raising the handle the pins would be moved over, leaving all frames in the hive hanging loose; this would combine the advantage of metal spaced frames and loose hanging as required, and to prevent the frames from moving slightly when turned over, the underside of the frames could be notched where it rests on bars; the bars would have a screw thread at each end to connect to outside handle on one side and nut on the other side. This would simplify hive making, as rabbets would not be necessary.

LILIAN G. BLAND.

Quatsino, B. C.

1. There is probably no reason to believe that foxglove honey is poisonous either for bees or people.

2. Thimbleberry or raspberry is one of the very best honey plants. Likely salmonberry is good also, as that is the name by which the white-flowering raspberry is known in some places. Huckleberry may be fairly good, although it is doubtful if any great surplus from it has ever been reported.

3. Nobody knows. Perhaps an acre; possibly a fourth of that.

4. Different factors make much difference in the number of days travel a colony can endure. Hot weather is more unfavorable than cool; and a ride on a boat would be very different from one with much jarring. Under favorable circumstances a journey of a month might be none too long; while conditions might be so unfavorable that a week would prove too long. To stand a journey of 15 days the frames should contain plenty of stores, yet they should not be so heavy as to risk breaking down; there should be abundant ventilation; water should be contained in sponges or otherwise, unless water can be sprinkled upon the bees at proper intervals; and the hive should be so placed that any jarring may be received endwise and not sidewise. Unless the combs are pretty old they should be strengthened by wiring. This is in reply to your question as to the condition of the *hive*; yet nowadays the tendency is toward shipping bees in packages without combs, so of course without hives, and that may be the better way.

5. It is not very safe to judge just how well a thing would work with bees until it has had an actual trial; but it is rather doubtful if your plan would prove very satisfactory.

## BEE-KEEPING FOR WOMEN

Conducted by MISS EMMA M. WILSON, Marengo, Ill.

### Feeding

We have only been keeping bees for six years, so don't know much about it yet, but we have increased the number of our colonies from 34 to 237, and have also added a second boy to the family. We "weighed our bees in" last fall as heavy as usual, but lost some by *breeding and starvation* in the cellar, and have had to feed extensively for the first time this season.

I intend to try some of Dr. Miller's queens this year, if we don't have to spend every spare penny for sugar. We have tried to get soiled sugar, but absolutely without success. Have you any sure place where you can get it? About the only bit of information I can give is to those sister beekeepers who use an Alexander or Ideal bee-veil, and that is when the cloth parts of either become soiled it can be put in the tub and washed. Use a brush to scrub the top, and after drying the skirt it can be ironed, but not the crown of the Alexander.

I enjoy reading Dr. Miller's confessed mistakes and troubles in "Fifty Years Among the Bees" as much as the useful hints and bee lore.

FLORENCE A. ROBINSON.

Pellston, Mich.

More than ever, with the price of sugar going skyward, it is important to learn the lesson that we should make our plans in advance to have on hand each spring extra combs of sealed honey, say two such combs for each colony. Not only do we need such combs as a safeguard against starving. When the white-honey harvest opens, before any honey is stored in the

supers, the bees will fill all vacancies in the brood-chamber. If, now, we have saved up sealed combs from the preceding year—and they may just as well be of dark fall honey—we can put them in the brood-chamber, and the white honey will at once go into the super. The result is that we swap just so much dark honey for light.

You are not likely to find soiled sugar in ordinary groceries where sugar is not handled on a large scale. Sometimes you can get it from the railroads, when a bag of sugar has been spilled in a freight car; but your best chance is with one of the big houses that handle sugar on a large scale, such as Sears, Roebuck & Co., or Montgomery Ward & Co., in Chicago

### Honey Plants—Shipping Bees

1. Is foxglove poisonous to bees? Is the honey from these flowers injurious either to bees or man?

2. Are the huckleberry, salmonberry, thimbleberry (all grow wild here) and shallot good bee-plants?

3. What area of clover, white, sweet, and alsike is required to give a surplus from one or two colonies?

4. In how many days journey will bees come through alive, and what are the best conditions for the hive to stand a journey of say 15 days?

5. Would the following idea be any improvement on the present type of hive fitting: Instead of having a wood and metal rabbet and self spacing frames, to have a steel or iron rod on which the end top-bars of the frames could rest, the rod having  $\frac{1}{4}$ -inch pins on it, and correct distances to space

### A Beginner

Last summer was my first experience with bees. A neighbor gave me three swarms; they were as late as June 30, July 1 and 3. They seemed to do well at first, but as I only had two hives (the third in a box with slats across), I examined the two other hives, which had appeared in good shape. I found the combs almost empty in one hive, and the other swarm starved.

The weather during that time was not fit to gather honey, and not knowing the bees were robbing, I had had the entrance wide open. I now began to feed syrup above the brood to the colonies left, and I soon found out they were still robbing the bees. I saved them by feeding every evening until I



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took them into the cellar. I fed them all winter. They seemed to do well until along in February, when one colony had diarrhea, and finally died. The other colony died in March.

1. Do you think my bees were robbed in the fall?

2. Does the old queen leave the hive before the young one leaves the cell?

3. Can I use, for a new swarm, old combs that are slightly moldy at the bottom?

4. I have some old combs that are all worker-combs excepting one end of one comb that is about two inches wide by five inches long, which is drone-comb. Is this drone-comb enough for one hive?

5. Is June 15 too late to save a swarm? If it is, do you kill the queen that leaves the hive and return the bees to the hive they left?

6. I have a large space of ground that I want to put in flower beds. What kind do you advise me to put in? There is a little white flower they use for border. Does it yield nectar, and do you know the name of it? Do the gilliflower and gladiolus yield honey?

7. Can I use the shallow extracting frames in the Langstroth hives? The brood-chamber is fitted with a cover 8 inches deep, or must I use supers to these hives? [MRS.] CHAS. WHITE.  
North Prairie, Wis.

## ANSWERS.

1. They were probably robbed.

2. When a prime, or first, swarm issues, the old queen goes with the swarm, and the swarming takes place generally about the time the first queen-cell is sealed, and the young queen will not emerge from her cell until a week or so after the prime swarm issues. In the case of an afterswarm, a young queen goes with the swarm, and another young queen or several of them are ready to emerge about as soon as the swarm has left.

3. Yes; but there is a little danger that the swarm may not be willing to stay on such combs unless it be induced to do so by the presence of a comb containing some brood. But if you give the moldy combs into the care of a strong colony for a few days, they will be cleaned up so that the swarm will promptly accept them. They can be put in the brood-chamber of the strong colony, or in a hive-body under or over the hive.

4. Yes, or more than enough.

5. No, it is not too late, although if the season should be poor you may have to feed for winter. If you wish, however, you can kill the queen, return the swarm, and destroy all queen-cells but one.

6. All the flowers you are likely to raise in a flower-bed are not likely to amount to much unless you have half an acre or more. Mignonette is one of the best. The little white flower used for borders may be sweet alyssum, on which bees may be seen at work; but whether they get much from it is another question. Stock (or gilliflower) and gladiolus are likely not of much value as honey-plants.

7. The orthodox depth of the frame for a Langstroth hive is 9½ inches, and it will not be satisfactory to use one very much shallower. You will need supers, although you may use as a

super a hive-body the same size as the brood-chamber if you use in it combs of the same size as those in the brood-chamber.

## My First Experience With Bees

While I was visiting my daughters, at Orchards, Wash., in 1913, I bought some hives in the flat, with the idea of beginning beekeeping. The putting up of the first hive was a Chinese puzzle, but after that the others went together quite easily. Our first swarm was bought of a neighbor and brought home the first week in July.

After a few weeks I placed another hive on the first, with starters in the frames. Before the first of September both were solid full of comb honey.

Our principal wild honey plants were fireweed, salal, mountain mulberry, spirea, blackberry, wild gooseberry, syringa, vetch and lupine. Vetch is wild in western Oregon and Washington, and grows everywhere. I found five different varieties. One a tiny dwarf only a few inches high with a

single lavender blossom. Another variety climbed on the bushes higher than my head, and had a large cluster of dark purple blossoms. One variety had a yellow blossom. The summers are very pleasant, there being no rain from the middle of June until October; from the middle of December until the middle of March it rains all the time.

Orchards is a township of prune orchards, and is 14 miles from Portland, Oreg., which is farther north on the map than Portland, Maine; but the winter that I was there (1913) the roses bloomed until the middle of February, then there was a freeze which stopped them a few weeks. In April they bloomed as they do in Connecticut in June.

Western Oregon and western Washington are noted for their large fir trees. Unless the land has been cleared it is stump land, and nearly everything has a background of large spindles and stumps with a heavy tangle of brush and undergrowth.

[MRS.] E. P. FLINT.

Rockville, Conn.

## DR. MILLER'S



## ANSWERS

Send Questions either to the office of the American Bee Journal or direct to  
DR. C. C. MILLER, MARENGO, ILL.  
He does NOT answer bee-keeping questions by mail.

## Data for United States Agricultural Department

1. United States Department of Agriculture asked me to fill out a schedule pertaining to condition of colonies in this township. There are two questions I do not understand, nor where to get the data for the honey-plants, and what the percent was before this year. The questions are as follows: "Condition of honey-plants compared with normal condition at this season," and

sence of sufficient data, you can only guess.

With regard to the first question, you cannot measure the condition of the honey-plants in feet and inches, nor yet in pints and quarts. But if you have been on the watch for several years—if you haven't you may be able to learn something about it from others—you can tell whether you think the present condition is better or worse



CHESTER KEISTER IN HIS APIARY AT CLARNO, WIS.

"Condition of colonies at this time compared with normal strength and health at this season."

2. Would it hurt bees to give them a frame of moldy comb without any honey in the comb? Will they clean it out? ILLINOIS.

ANSWERS.—1. No great wonder you should find it somewhat troublesome. In the ab-

than the average. If only half as good, then of course it is 50 percent. If about a fourth better than the average, then it is 125 percent, and so on.

Much the same way as to health and strength of colonies. If colonies are just as healthy as usual, then of course they are 100

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percent as to health. If they are below the average as to health, then you will mark them 75 percent, 90 percent, or whatever it may be, but don't ask me to say how you will tell when the colonies of an apiary are half as healthy as the average, so as to be marked 50 percent. I don't know how. You'll just have to guess the best you know how. As to strength, you can be more definite if you have kept a record for a number of years and know that during that time the average has been a certain number of frames of brood at a certain time, say 5 frames. If this year it's 5½ frames, then it will be 110 percent. If it's 4 it will be 80 percent, and so on. If you have no such record, you can only guess, and I don't begrudge you the job.

2. Yes, it will be all right if no foulbrood is in the comb.

## Robbers—King-Birds—Waxmoth

1. I had six colonies of bees and one of them was not working like the rest. I saw a bee go in, and in about a minute or two bees came out clung together, and rolled off on the ground, and then both flew away, and in about five minutes 25 or 30 bees went in, carrying pollen on their feet; then some came out and flew away again, while another two came out fighting. Can you tell me what is the matter?

2. Will a bee-bird destroy a colony of bees or will they just destroy the drones?

3. As I was inspecting one of my swarms this spring, I found some white worms on

## Honey-Plants of the South—Transferring

1. Do bees gather honey from California and Japanese privet?

2. Which kind of poplar is the honey-plant?

3. Where can I get a book on honey-plants of the South?

4. I hived a big swarm and put on a super at once, but bees are laying out. Do you think they will swarm again?

5. The swarm I hived came out of a box-hive. Would it be all right to transfer the bees from the box-hive into a frame hive? The box-hive is full of honey. TEXAS.

ANSWERS.—1. I don't know, but have an impression that privet is not an important honey-plant.

2. *Liriodendron tulipifera* is the botanical name of a honey-tree that goes under the name of poplar, also whitewood, and tulip-tree.

3. You may find what you want by inquiring of the Agricultural College of your State.

4. Not very likely.

5. Yes, although the honey is in the way in transferring.

## Ants—Distance Bees Go

1. What causes ants and moths to get into hives?

2. How far have bees been known to go to gather honey?

3. Should bees have fresh water given to them every day? KANSAS

ANSWERS.—1. Ants enter hives because it

beginning to lay; and it is a good plan to make a business of hunting up the queen in each colony every year, at least a little before there's any danger of swarming, and clipping any that are found unclipped.

3. That depends. A good many, like myself, never trap drones. They prefer to destroy them in the form of brood, or, still better, to suppress all, or nearly all, drone-comb. But if you want to trap them after they are mature, you can have traps on at any time when there are drones to be trapped.

4. All but those that you consider your best drones in one or a few colonies.

5. The residue that is left after wax is pressed out of combs.

6. There are a number that are good, the two most in use being Dadant's-Langstroth and Root's A B C and X Y Z.

## Shipping Bees from the South, Etc.

1. Would it have any effect on bees if I had them shipped to me from the South; that is, the climate conditions?

2. Will two different kinds of bees bother each other if kept in one apiary?

3. Can honey be expected from a colony that was started from a pound of bees in the spring?

4. How far apart should beehives be placed?

5. How would you recommend wintering bees as far north as I am?

6. If in the cellar should any screen be placed in front of entrance? MINNESOTA.

ANSWERS.—1. Other things being equal, the shorter the distance bees are shipped the better, but the bees are no better or worse for the southern climate.

2. If you mean will bees of different kinds quarrel, no. Several kinds will live just as peacefully in the same apiary as if they were all of the same kind. If you mean whether they will bother about mixing, yes. You can keep only one kind in your apiary if you want your bees to keep pure.

3. That's asking a good deal of them; but it is not at all impossible with a good honey flow, and especially a good late flow.

4. That depends. On an entirely level surface, with no trees or other objects, 10 feet is none too close. If there are trees, buildings, or other objects by which the bees can mark their locality, then all that is needed is have enough room between hives so that the beekeeper can work comfortably, say two or three feet. But if you want to economize room, set your hives in pairs, the two hives of the same pair almost touching, and then a space of two feet or more between that pair and the next pair.

5. In the cellar.

6. No; unless it be a screen of wire-cloth having three meshes to the inch. That will bar the passage of mice, but not bees.

## Feeding Capped Honey to Bees

1. If you had combs of old honey, either in hives where bees had died or if you had combs of honey that were kept over, would you uncapped the honey before putting it in the hives where there were bees? Do you believe bees would ever uncapped this old waxy honey and clean it out of these combs?

2. In forming colonies with bees in pound packages, would you give them honey capped or uncapped?

3. I notice where a colony dies that robber bees will rob out around the brood-nest and leave combs of honey nearly or quite full at the sides and along the top bars. This honey is not granulated altogether, but there seems to be some reason why the bees do not take it while it is capped. NEBRASKA.

ANSWERS.—1. I don't believe there will be any trouble but what the bees will use that honey all right, and there will be no need of



MISSOURI BEES ARE BOOMING THIS YEAR, THE FIRST CROP FOR A GOOD WHILE—S. J. KNOX APIARY AT BOWERS' MILL, MO.

top of the frames; they were about half an inch long. Can you tell me what kind of a worm it was?

4. What does a honeybee get from dandelion? Do they get any honey?

5. Do bees gather honey from apple blossoms?

6. What do bees get from pumpkin, squash, cucumber, and melon blossoms?

7. Do bees work on black and red raspberries, and what do they get? PENNSYLVANIA.

ANSWERS.—1. Bees from other hives try to enter and steal honey, and are pounced upon by the guards at the entrance.

2. King-birds, or bee-birds, have the reputation of killing both drones and workers, although it is said that the workers are not swallowed, but the juices are extracted and the carcasses spit out.

3. It was probably the larva of the wax-moth, commonly called wax-worm.

4. Both honey and pollen, lots of both.

5. Yes.

6. Both nectar and pollen.

7. Yes; they get both nectar and pollen.

is a warm place to have their nests, and sometimes to get honey or bees. Moths enter to lay eggs where their young can have their proper food, wax.

3. I think the farthest ever reported was seven miles; but probably none of your bees go farther than two or three miles.

3. No; keep a tub standing with cork-chips in it, and fill it with water only as often as it needs replenishing.

## Miscellaneous Questions

1. Should I have double-walled hives here in northwestern Ohio?

2. When should queens be clipped?

3. When should drone-traps be put on the hives?

4. Should all the drones be destroyed?

5. What is slumgum?

6. What is the best book for the beginner? OHIO.

ANSWERS.—1. Opinions differ; but I think the majority in our region prefer single-walled hives.

2. They may be clipped any time after



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your uncapping it either. You will probably find that you can use it anywhere for the bees that you could use any other honey.

2. It will be all right to give it either capped or uncapped.

3. I never knew robbers to leave honey because it was sealed except under one condition. Sometimes it happens that a comb of sealed honey is given more room, so that the bees build fresh cells over the cap-pings and fill them with honey. In that case they will never uncup the old honey, but will starve with it in the cells, and robbers will not uncup it either.

## Queenless Colony—Rearing Queens

One of my colonies went into winter quarters heavy with honey and bees, but now I find about half a teacup of bees, ample stores, no queen, and the whole thing as good as dead. The honey in the combs has a watery surface, looking very much like a mess. What is the trouble?

2. One of my colonies has brood in a fair quantity, no eggs, and I could not find any queen, but found a few queen-cells. I destroyed all but one, which was good sized and not yet capped. Is it too early for this colony to rear a good queen?

3. What about combs that are quite white with mold; should I use them?

PENNSYLVANIA.

ANSWERS.—1. Looks a good deal as if the colony had lost its queen so early last fall or summer that nearly all the bees have died off from old age.

2. Doubtful about the value of that queen, although she may be fair if it happened that the bees were busy gathering during the five days the young queen was fed.

3. That white mold doesn't seem to matter.

## Wintering in Oregon

What is the best cover for wintering in this locality which has a rainfall varying from 60 to 100 inches with little or no frost or snow?

OREGON.

ANSWER.—I don't know of anything better than the one I use, described in "Fifty Years Among the Bees." A cover of  $\frac{3}{8}$ -inch stuff with the grain running one way, another the same with the grain running the other way, a  $\frac{3}{8}$ -inch space between them made by strips  $\frac{3}{8}$  by  $\frac{7}{8}$ , and a tin, or still better, zinc cover over all.

## Building Up Colonies—Handling Nuclei

1. Would it be advisable to put new swarms in hives with old combs? (The bees from this hive died during winter from lack of stores; one-third of the cells still have bees in them.)

2. How do you handle a nucleus?

3. In dividing for increase, is it better to take queen from original colony and let the original colony rear a new one?

4. I have a hive of mixed bees to which I gave an Italian queen last fall (colony was strong, but the bees were old; the colony was queenless some time before I noticed it). It is rather weak this spring. How should I handle it?

5. Would it pay to build up an apiary by buying 2-frame nuclei with queen?

6. Are the no-beeway sections as well liked in the markets as the beeway sections?

7. Is it a good plan to help bees increase to feed syrup in the spring before blossoms come out?

PENNSYLVANIA.

ANSWERS.—1. With decaying dead bees in the combs, there is danger that a swarm put into such a hive would desert. If a frame of brood were given, the bees might not desert. The better way will be to have the combs cleaned out before they are given to a swarm. Put them in a hive-body under or over a strong colony, and in a few days they will be cleaned out.

2. Your question is so vague that I don't know just what you mean. Perhaps you want to know what shall be done to help a nucleus to build up. If strong enough, with

time enough it will build up with no help from you except that you shall give it combs filled with foundation either as fast as needed or all at once. If you want to help it to build up faster, a good way is to swap from time to time one of its combs containing a good share of young brood and eggs for one from a strong colony containing sealed brood well advanced. If your question means something else, please come again.

3. It is best that the queen remain on the old stand where the whole field-force will be. But in that case the queenless part will be in a discouraged condition, with no field-bees and no honey coming in, so the queen it rears is not likely to be of the best. So we compromise: Leave the queen with the part put on the new stand; the queenless part, being on the old stand, will have plenty of honey coming in, and will be in good shape to have queen-cells of the best sort. A week later, when the feeding of the royal larvae will be over, make the two hives swap places, and all will be lovely.

4. Give it a frame of brood with adhering bees from a colony having at least five combs well filled with brood, and continue the same thing every ten days or two weeks as long as necessary.

5. Yes, it's a good way.

6. By "no-beeway sections" you probably mean plain sections. They may be liked as well in some markets, but I think generally not.

7. I never do it myself, and I doubt its being a good thing for you. Of course, you must feed if there's the least danger of starving, and then honey is much better than syrup.

## Inducing Queen to Work in Super—Pure Stock

1. I have five colonies that are strong in brood and bees, and I would like to keep them from swarming. I put the supers on the last of March with what bait sections I had, and they removed the honey from the sections to the frames below. How can I induce them to go to work in the supers for I want to get as much comb honey as possible? Would you advise putting an empty hive-body below to give the queen plenty of room?

2. I would like to introduce pure Italians

the last of the season, and am thinking of experimenting some in queen-rearing. I would like to know, if I could keep pure bees by starting with two or more colonies and keeping the drones trapped in the colonies I do not wish to breed from?

MISSOURI.

ANSWERS.—1. Like enough your colonies have done about the best they could. Putting on supers until there is a sufficient flow will not hurry up storing, although the honey that the bees carried down out of the sections probably did some good in helping to build up. As soon as the harvest begins the likelihood is that you will see good work in the sections. Putting an empty hive-body below is a good thing to be done early if the queen has not room enough without it, but by the time this gets into print the season will be so far along that giving more brood room below would do harm instead of good, so far as work in supers is concerned.

2. If there are no other bees anywhere near you, you can keep your stock pure in the way you propose. The probability, however, is that you are not thus isolated, and at least part of your young queens will be mated, the danger being the greater in proportion to the number and nearness of bees surrounding you.

## Hiving Swarms—Queens

1. What would be the result if after hiving a swarm I would later remove the bottom of the hive and set it on the old colony? Would they unite?

2. Can hives be set too close together? If not how far apart should they be placed?

3. What advantages have the ten-frame hives over the eight?

4. When hiving a swarm, should I let it set there a few days before I move it to the apiary?

5. How old does a queen get?

6. What is the cause when a colony has little black bees? They cannot fly. Is it the queen's fault?

7. What causes the queen to die in winter?

8. Are bees that work on red clover more profitable than those that do not?

9. Can you smoke the bees too much, or is it good for them?

OHIO.

ANSWERS.—1. They would unite, but if it was done in less than ten days after swarming they might swarm again, unless an excluder were used. It would work better



A RATHER LONG SWARM CAUGHT BY F. F. PORTER, OF OAKLAND, CALIF.

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to put the old hive over the new. In that case you should use an excluder if you unite in less than ten days. After ten days, if you cut out queen-cells you can unite without excluder.

2. If trees, buildings, or other objects are present to help the bees to mark the location, they may be set as close together as will allow you to work comfortably between them. If there are no such objects, then it is better to have a space of perhaps five feet to separate the hives, or pairs of hives.

3. Perhaps the greatest advantage is that there is room for more stores, making very much less danger of starving in winter or spring.

4. Never; the sooner it is moved where it is to stay the better. If left over night, and then moved, there is danger of loss of bees.

5. Generally 2 or 3 years old; in rare cases even 5 or 6 years.

6. Possibly a case of paralysis. Some think the queen to blame; some not.

7. Likely old age. Some queens are older at a year than others at two.

8. Yes.

9. Yes, indeed, you can hurt by too much smoke. It's never any benefit to the bees; and you should never smoke any more than just enough to keep them under subjection.

### Transferring—Decoy Hives—Wild Bees

1. What can I do with bees in old-fashioned hives? The bees are working and seem fairly strong.

2. How many gallons of bees should there be to constitute a colony strong enough to pay?

3. Is there a satisfactory decoy hive; if so, how is it made and used?

4. How can I proceed to find wild bees?  
INDIANA.

ANSWERS.—1. Leave them as they are until they swarm; hive the swarm in a movable-frame hive, setting it on the old stand with the old hive close beside it; three weeks later all the worker-brood will be hatched out, when you can break up the old hive, adding the bees to the swarm.

2. Early enough in the season a colony of 10,000 bees might be satisfactory enough, while in the harvest 40,000 would not be considered so very strong. So you see it varies according to the time in the season. If you

want to get it in quarts, count about 5000 bees to the quart.

3. Yes, any hive makes a good decoy hive; all the better if some old honey-comb is in it; only you must look out that the comb doesn't get to be wormy. The decoy hive may be set anywhere, in or out of the apiary; some put them in crotches of trees in the woods.

4. It would be going outside the scope of this department to give full instruction for finding wild bees; but the chief thing is to use honey as a bait, watch what direction the bees take when they leave the bait, moving the bait and gradually following up the line of flight until the home of the bees is reached, using also cross-lining.

### When to Add a Super

My bees are working early and late now. I have some honey in the brood-chamber. Would it be advisable to put on a super before much honey is stored. If one was added at such a time would the bees continue storing in the hive until full before starting to store in the super, or would they start in the super as soon as added?

MISSOURI.

ANSWER.—The bees are likely to continue filling up all the space available before beginning in the super, but it is well to put on supers a little before they are really needed. The old rule was to put them on when bits of white wax are seen along the top-bars, but that is rather late. As you are probably in a clover region, a good rule is to give supers just as soon as you see the first blossom on white clover, although there may be no storing in supers until ten days later.

### Bees Tearing Combs

I have a strong colony of Italian bees which has some honey and a good laying queen. For the last two weeks they have been tearing very large holes in empty combs and carrying it out of the hive. The movable combs have plenty of space between them. Why do they do this? OHIO.

ANSWER.—Without seeing it one can only guess. A fair guess is that the comb is so offensive by being badly molded or in some other way, that they are discouraged about cleaning it out.

## REPORTS AND EXPERIENCES



### Fires Injure Crop

The bees wintered well last winter, but the spring was hard on them. January and February were mild; March very rough; April dry, cold and windy.

We had a forest fire; it burnt for three weeks; the wind blew the smoke one day from one direction, the next day from another, so hard sometimes that a man could not see a thing five steps away. That was hard on the bees, too; they had to stay in during that time. The fire destroyed all the early low honey-producing plants and many million feet of timber.

May was dry until the 15th; since that time we have had showers nearly every day, and now everything is just booming.

The way I introduce my queens: When I notice a queenless colony I catch my extra queen, open the queenless colony and hold the queen by the wings on top of the best occupied frame. Directly comes a bee and salutes her majesty, gives her a drop of food, fans her wings; the whole colony changes to a different tone; the nearest bees coming swarming, fanning their wings for happiness, and sometimes even the new-born babies do the same; then I let the queen loose, cover

up the hive, and she is introduced, and the queen attends to her job at once.

I tried the cage method, the smoke method and the daubing method, and still I had to lose some, but my last method works successfully. I have never lost any queens since then. I hope to use this method henceforth.

PETER SCHAFFHAUSER.  
Havelock, N. C., May 18.

[To our mind the foregoing letter from our good friend Mr. Schaffhauser illustrates the correctness of the statement made by our learned Swiss correspondent, Mr. Spuhler, in his article on introduction of queens, page 160: "In every case the temper of the bees plays a very important role. If they are in good humor, everything goes well....." Evidently the queens introduced by Mr. Schaffhauser in so simple a way had to deal with bees in good humor. We have seen many cases where the queen so introduced would have been treated as a robber. Does it not look to you as if the temper of

the bees be really at the bottom of all success or failure in queen introduction?—[E.]

### Brush for Painting Foundation

I have found that if a brush is prepared for painting foundation as I have described, that it will be further improved by cutting out about one-third or more of the hair lengthwise of the brush; that is, only the center of the brush, more properly speaking, thinning out the hair so that it will be of a uniform thickness from end to end lengthwise. If the hair of the brush is longer through the center of the bottom than at the ends, it should be trimmed with a shears square across all the length of the brush.

EDWARD HASSINGER, JR.  
Greenville, Wis.

### To Stop Robbing

The following method has never failed to stop robbing for me. Lay two boards across the top of the hive with the ends projecting about two feet in front. Over this spread a blanket or old carpet. The carpet is fastened tight against the sides and back of the hive, leaving a dark space in front. Since all possible light is shut out from in front the robbers are unable to find their way to the entrance of the hive readily, while the bees which belong there will go in without trouble.

J. H. MORRIS.  
Kansas City, Mo., Jan. 28.

### The California Crop

The honey crop in southern California is a disappointment to most beekeepers. No rain since March, and cool, cloudy weather has cut the crop very short. Orange honey not over one-third of a crop. Sage is not yielding at all well, and is sure to fall away below a crop. Buckwheat (wild) is blooming, but bees are getting very little honey from it. I think the crop will not exceed one-half at present.

L. L. ANDREWS.  
Corona, Calif., June 3.

### North Carolina Report

This has been a trying year for local bee-men. Our spring losses ran about 25 percent for the county. Then up to May the first bees were starving. During May poplar, berries and clovers yielded lightly. My yard of 11 colonies (no winter loss; 8 were packed in quadruple cases) have gathered some excellent clover honey (white and crimson). Very little swarming has occurred until lately, and it is light yet. Some yards visited have gotten hardly any surplus. We are on the eve of our sourwood flow, and of course are anxious. It has yielded hardly any for the past two seasons. Frequent rains have fallen for two weeks.

BRUCE ANDERSON.

Salem, N. C., June 10.

### Abundance of White Clover, Yet Prospects Not the Best

At present there is more white clover in bloom than I have ever seen during any of the best seasons in this locality. Under normal weather conditions there would consequently be a heavy honey-flow. But this is not exactly the case, and I suppose that cool nights cause a drawback. White clover seems to yield the most honey only when days and nights are warm, with enough rain to supply the ground with sufficient moisture. On account of prevailing cool weather during all the spring, bees did not build up quickly, especially being short of stores as a consequence of the poor season of 1938.

For some time bees have been storing honey in the extracting supers (8 frame Langstroth), and while they should be ready for extracting by this time, the best are only a little more than half filled. So far, we are free from foulbrood.

St. Meinrad, Ind., June 4.

### A Glimpse from South Dakota

I do not believe in putting flowers on a man's grave, but rather in giving him a bouquet while he is living.

I see that Mr. Francis Jager, of Minnesota, has been elected president of the National Beekeepers' Association, and for the benefit of some of the readers of this paper, I want to say that I had the privilege of meeting Mr.



# American Bee Journal

Jager at the Iowa State meeting in Des Moines, of hearing him talk, of sitting with him during the lunch hour, of going to his train with him, and it made a deep impression on my mind, which stays with me.

I venture the assertion that he is one of the most practical and thoroughly up-to-date men in the country, and it is a blessing to us all to know that he is in a State that is doing more for apiculture than any other State.

Dr. Phillips is also the right man in the right place, and I trust that with these two men working in perfect harmony we shall shortly reap some great results. With Mr. Jager as president of the National, we shall all feel an interest in it and shall want to boost it.

R. A. MORGAN.  
Vermillion, S. Dak., April 8.

## More Disease in California

I with the rest have had the same trouble that my neighbor, Mr. Miner, of Fowler, Calif., had with his bees, *Nosema apis*. Some of the bees are *pinched up*, others *spiny*, others *wobbly* or *shaky*. They crawl out of the hive and wander off to die. Some hives cast out sick bees as an act of house cleaning, and the very bees that act as police to cast out the lepers are the sick bees of tomorrow. The queen sometimes seems to get the disease and dies. The brood dies from disease or is chilled (I think it is chilled). I tried Mr. Poppleton's remedy, and found it severe, somewhat like cutting a man's head off to cure rheumatism.

I did not like this mode of curing the trouble. I consulted my neighbor beekeepers, who told me to put sulphur on the alighting-boards. I tried the plan with indifferent success; observing that sulphur had a good effect, but that the mode of using it was at fault. About this time I saw men fighting mildew on grapes and red spiders on fruit trees by blowing fine flour of sulphur over the vines and trees during the warmest part of the day, so as to get the best use of the sulphur for their purpose.

I got the inspiration to try blowing a fine cloud of flour or sublimated sulphur into the entrance of each hive. I think that my nephew and I had 150 sick colonies at that time; in fact, the whole apiary of nearly 300 colonies seemed in a very demoralized condition; the bees crawling over the ground in all directions and dying by the thousands. We used a machine that is used here on the ranch to sulphur the vines and trees. We blew in quite a blast of fine sulphur into each hive about twice a week. We treated the whole apiary. It did not cause the brood to die like the Poppleton method did, but the bees got better all at once, and seemed well in about three weeks. We had a return of the disease in a few colonies, but the sulphur spray cured all of them.

The sulphur seemed to do the most good when used during the hottest period of the day, preferably above 90 degrees Fahr. I believe the sun heat has something to do with the good effect of the sulphur.

Selma, Calif. O. S. DAVIS.

## Classified Department

Advertisements in this department will be inserted at 15 cents per line, with no discounts of any kind. Notices here cannot be less than two lines. If wanted in this department, you must say so when ordering.

### BEEES AND QUEENS.

**FINEST Italian Queens.** Send for booklet. Jay Smith, 1150 DeWolfe St., Vincennes, Ind.

**PHELPS' Golden Italian Queens** will please you.

**FINE three-banded Italian queens.** Circular and price list free. J. L. Leath, Corinth, Miss.

**RHODE ISLAND northern-bred Ital. queens.** \$1.00. Circular. O. E. Tulip, Arlington, R. I.

**TELL** several thousand people what you have for sale with a few words in this department.

**FOR SALE—Untested Golden Italian queens** 60c each J. F. Michael, Winchester, Ind.

**DOOLITTLE & CLARK's** untested queens \$1.00 each; \$5.00 for 6; per dozen, \$50.00. Marietta, N. Y.

**BEEES AND QUEENS** from my New Jersey apiary. J. H. M. Cook, 141st 84 Cortland St., New York City.

**PHELPS' Golden Italian Bees** are hustlers

**READY** now 1-lb. 3-band Italian bees with queen, \$1.65. 2-fr. nuclei with queen, \$2.25. Rosedale Apiaries. J. B. Marshall, Big Bend, La.

**NORTHERN-BRED** Italian queens of the E. Mott strain. Untested, 75c for July and on. Send for free list. Earl W. Mott, Glenwood, Mich.

**FOR SALE—Tested hybrid queens** by return mail at 25c each. Peter Schaffhauser, Havelock, N. C.

**3-BAND ITALIAN Queens** bred for business. Untested, 50c each. Whitt & Lovejoy, Sinking Creek Apiaries, Gimlet, Ky.

**PLACE** your order early to insure prompt service. Tested, \$1.25; untested, \$1.00. Italians and Goldens. John W. Pharr, Berclair, Tex.

**GOLDEN ITALIAN QUEENS**, no better honey gatherers anywhere at any price. Untested, \$1.00. Tested, \$1.50. Wallace K. Beaver, Lincoln, Ill.

**FINE ITALIAN Queens** by return mail, island bred. Tested, 6 for \$6.00; 12 for \$11. Untested, 6 for \$5.00; 12 for \$9.00. No disease. E. J. Blaine, St. Petersburg, Fla.

**FOR SALE—Bright Italian queens** at 55c each, or \$6.00 per dozen. Safe arrival and satisfaction guaranteed. T. J. Talley, Rt. 3, Greenville, Ala.

**THREE-BANDED** Italian queens. Prices: One, 75c; 12 for \$8.00. Tested, \$1.25 each. Write for prices on nuclei and full colonies. J. F. Diemer, Liberty, Mo.

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**ITALIAN QUEENS** as good as can be produced. Untested, 50c each. Sel. unt., 60c. Tested, \$1.00. Safe arrival and no diseases. Guaranteed. W. J. Forehand & Sons, Ft. Deposit, Ala.

**ITALIAN QUEENS** that produce hustlers. Nothing but select queens sent out. Untested, \$1.00; \$6.00 per dozen. A. E. Crandall & Son, Berlin, Conn.

**BRIGHT ITALIAN Queens** at 60c each; \$6.00 per doz; \$50 per 100. Safe arrival and satisfaction guaranteed. W. W. Talley, Rt. 4, Greenville, Ala.

**VIGOROUS** prolific Italian queens, \$1.00; 6, \$5.00. My circular gives best methods of introducing. A. V. Small, 2302 Agency Road, St. Joseph, Mo.

**FOR SALE—10-acre fruit farm**, near town, well improved; ideal location for bees. Will sell cheap. Address, R. C. Hugg, Burlington, Iowa.

**QUEENS—3-banded Italians** untested, 50c each. We guarantee safe arrival and satisfaction or your money refunded. Sinking Creek Apiaries, Gimlet, Ky.

**GOLDEN Italian queens**, select tested, \$1.25. Tested, \$1.00. Untested, 60c; 12, \$7.00. Select untested, 70c; 12, \$8.00. No foulbrood. D. T. Gaster, Rt. 2, Randleman, N. C.

**LEATHER COLORED "Nutmeg strain"** of queens, \$1.00; doz., \$10. Tested, \$1.50. Special price on large lots. Return mail. A. W. Yates, 3 Chapman St., Hartford, Conn.

**A LITTLE AD** in our classified columns will sell that perfectly good equipment that you no longer need. Only 15 cents per line each insertion.

**CHOICE Italian, Carniolan or Caucasian** queens, Untested, 75c. Tested, \$1.25. Breeding queens, \$2.50. Virgins, 40c each; 3 for \$1.00. C. W. Finch, 1451 Ogden Ave., Chicago, Ill. Phone Haymarket 3381.

**LEATHER** colored Italian 3-band queens. Untested, 70c. Tested, \$1.00, by mail. No disease. Safe delivery guaranteed. Send your orders to C. H. Cobb, Belleville, Ark.

**"QUEENS OF QUALITY"** reared from a daughter of one of Dr. Miller's famous queens, \$1.00 each by return mail. After July 1st, 75c each; \$8.00 per doz. J. Ivan Banks, Dowlstown, Tenn.

**My BRIGHT Italian queens** will be ready to ship after April 1st at 60c each. Send for price list. Safe arrival and satisfaction guaranteed. M. Bates, Rt. 4, Greenville, Ala.

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**GOLDEN QUEENS** that produce Golden Workers of the brightest kind. I will challenge the world on my Goldens and their honey-getting qualities. Price, \$1.00 each; Tested, \$2.00; Breeders, \$5.00 and \$10.00. 2Atf J. B. Brockwell, Barnett, Va.

**FOR SALE—Good Italian queens**, untested, 75c; tested, \$1.00; nuclei, 2-frame, \$3.00; 1-lb. package, \$2.00; 2-lb. package, \$1.00. Untested queen with bees at above prices. Will begin to send about April 1st. G. W. Moon, 1904 Park Ave., Little Rock, Ark.

**PHELPS' Golden Italian Queens** combine the qualities you want. They are great honey gatherers, beautiful and gentle. Mated, \$1.00; six, \$5.00; Tested, \$3.00; Breeders, \$5.00 and \$10. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

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**CARNIOLAN, golden, and 3-banded Italian** queens. Tested, \$1.00. Untested, 75c; 6, \$4.20; 12, \$7.80. 1/2-lb. bees, 75c; 1-lb. \$1.25. Nuclei, per frame, \$1.25. No disease; everything guaranteed. Write for price list. C. B. Bankston, Buffalo, Leon Co., Tex.

**AN established strain** of honey gathering golden stock. Honey is what you want without much swarming. Book your orders early to save delay. One untested queen, \$1.00; 6 for \$5.00; 12 for \$9.00. Write us what you want. T. S. Hall, Talking Rock, Ga.

**GOLDEN Italian Queens** bred strictly for business that produce a strong race of bees as honey gatherers. Untested 75c each; 6 for \$4.25; 12, \$8.00. Safe arrival, prompt delivery, and satisfaction guaranteed. L. J. Dunn, Box 338, J. R. R. 6, San Jose, Calif.

**GRAY CAUCASIANS—Early breeders**; great honey gatherers; cap beautifully white; great comb builders; very prolific; gentle; hardy; good winterers. Untested, \$1.00. Select untested, \$1.25. Tested, \$1.50. Select tested, \$2.00. H. W. Fulmer, Box 10, Andalusia, Pa.

**QUEENS, improved three-band Italians** bred for business, June 1 to Nov. 15. Untested Queens, 75c each; dozen, \$8.00; Select, \$1.00 each; dozen, \$10. Tested Queens, \$1.25; dozen, \$12. Safe arrival and satisfaction guaranteed. H. C. Clemons, Rt. 3, Williamstown, Ky.

**FOR SALE—Three-banded Italian queens** and bees from the best honey-gathering strains obtainable. Untested queen, 75c; 6, \$4.25; 12, \$8.00. Tested queens, \$1.25; 6, \$7.00; 12, \$12. For select queens add 25c each to above prices. Queens in quantity lots or bees by the pound, write for prices. Robt. B. Spicer, R.F.D. 181, Wharton, N. J.

# American Bee Journal

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MULLIN'S Unrivalled Italian Queens. Gentle and prolific, three-banded, and one of the very best honey strains. After May 1st to July 1st, untested queens, \$1.00 each; \$0.00 per dozen. After July 1st, special rates. Three-frame nuclei with untested queen, \$2.75. After June 1st try one; you will want more. Satisfaction guaranteed.

O. S. Mullin, Holton Kan.

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SPECIAL low prices on queens. After July 1st, we will offer untested queens at 50c each; lots of 50 or more, 45c. We have 500 or more of choice tested queens we are offering at \$1.00 each; 50 or more 75c each as long as they last. Our stock is of the three-band Italian, and guaranteed to be of the best.

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QUEENS by return mail or money back. Guaranteed purely mated 3-banded Italians. Northern strain bred for gentleness, honey gathering and wintering. Select untested, 75c each; 6 for \$1.00. Select tested, \$1.25 each. Write for prices on large orders, also bees by the colony. State inspector's certificate. Satisfaction guaranteed.

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FINE ITALIAN QUEENS by return mail. Select Golden and 3-banded lined to select drones, hardy, prolific honey gatherers. Single queen, \$1.00; 2 queens, \$1.75; 3 queens, \$2.50; dozen queens, \$9.00; six or more at doz. rates. No disease. Safe arrival. I positively guarantee every queen to give reasonable satisfaction.

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D. L. Dutcher, Bennington, Mich.

FOR SALE—Pure Italian bees with tested queen, \$4.50 per col.; cols. with mated queen, \$4.00 each; light colored hybrid cols. with queen, \$3.50. All from the J. P. Moore's strain and in 8 frame hive bodies in winter cases, standard full depth self-spacing Hoffman frames, 8 to each hive. All combs straight, strong and healthy with plenty of honey, f. o. b. here. 1/2-lb. package wire cages without queens, one, \$1.50; 2, \$2.00. If queens are wanted add price of queens to package. Untested, 85c. Tested, \$1.50. Breeders, 3.00 to \$5.00.

Wilmer Clarke, Earlville, Mad. Co., N. Y.

CARNIOLAN, Golden and Three-Banded Italian queens from April to October. Tested, \$1.00 each; 6, \$5.40; 12, \$10.20. Select tested \$1.25 each; 12, \$13.80. Untested, 75c each; 6, \$4.20; 12, \$7.80. Select untested, 85c each; 6, \$4.80; 12, \$9.00. Breeders, \$3.00 to \$5.00. Virgins, 50c each; 6, \$2.50; 12, \$4.00. Bees, 1-lb., \$1.25; 2 lbs., \$2.25; 1/2 lb., 75c. Nuclei, 1 frame, \$1.25; 2 frames, \$2.25; 3 fr., \$3.00. Full colonies with tested queens, 8 fr., \$6.50; 10 frame, \$7.00. No disease, safe delivery and satisfaction guaranteed. Money must accompany the order. Write for price list.

I. N. Bankston, Buffalo, Tex.

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NEW HIVE!—Tested out three years. More honey produced. No heavy lifting. Non-swarming and robber proof. Winters properly without labor or expense. Present equipment easily changed to it. Other advantages. Send for particulars. Wm. F. McCready, Bx. 2, Estero, Lee Co., Fla.

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WANTED by a young man with no bad habits or language. Have had five years' experience with bees, with aid of the teaching of bee journals and books. Want a position in a large apiary in the State of Colorado or Texas. Best of references given.

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Unhulled White Sweet Clover Recleaned	25C	\$2.00	\$5.10	\$16.00		\$ 4.80	\$ 4.50	25 to 30
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When seed is wanted by parcel post, be sure to include postage. Bags will be included in the weight in parcel post shipments.

**PLEASE NOTE**—All of our seed is thoroughly cleaned. The scarifying process usually breaks some of the seeds and we remove all broken seeds. This is an important saving to you. Samples on application.

**YELLOW SWEET CLOVER**—Many people fail to recognize the value of the biennial yellow sweet clover as a honey plant. The fact that it blooms two weeks earlier than the white variety makes it especially valuable to the beekeeper.

Be sure, however, to get the biennial variety as quoted above.

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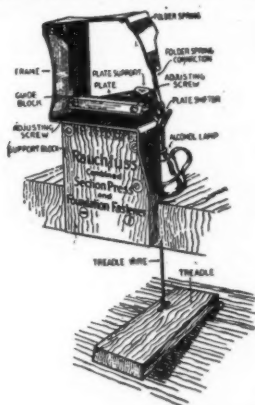
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To order your supplies, and thus have everything in readiness for spring  
We carry a full line of Root's Goods at all times, and are always prepared to fill any and all orders on short notice.

Hives, supers, frames, sections, comb foundation, section-presses, foundation-fasteners, queen-excluders, queen, and drone traps, swarm-catchers, feeders, honey and wax extractors, capping melters, honey-knives, honey-tanks, honey-packages, shipping-cases, bee-escapes, bee-veils, bee-gloves, bee-brushes, smokers—in short, everything the beekeeper requires for the proper conduct of an apiary.

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## Make More Profit by Reducing Cost of Production



Comb-honey producers can put up their sections complete in less than half the time with a **Rauchfuss combined section-press and foundation fastener**. Now used by hundreds of Western beekeepers who would not think to be without it any more.

It is guaranteed to do more and better work than any other device on the market. Your money back if not entirely satisfactory. Made for  $4\frac{1}{4} \times 4\frac{1}{4}$  and also for  $4 \times 5$  sections.

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## BARNES' Foot-Power Machinery

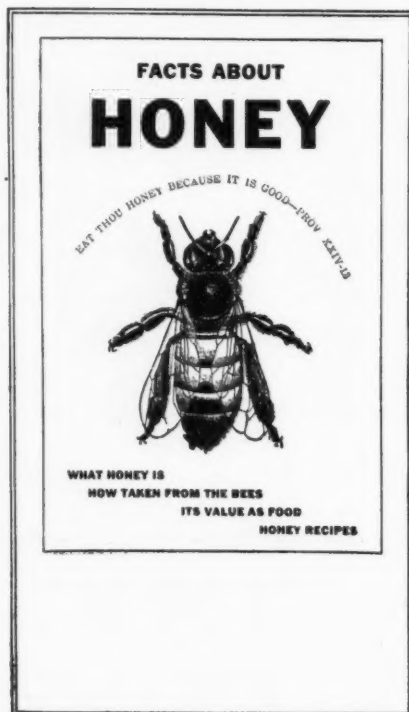


Read what J. I. Parent of Chariton, N. Y., says: "We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap. 100 honey-racks, 500 frames, and a great deal of other work. This winter we have a double amount of hives, etc. to make with this saw. It will do all you say of it." Catalog & price-list free

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**Beekeeper's Guide**, by A. J. Cook—This book on bees is also known as the "Manual of the Apiary." It is instructive and interesting, as well as practically scientific. It has 544 pages and 205 illustrations. Bound in cloth. Price, postpaid, \$1.20; or with a year's subscription to the American Bee Journal, both for \$1.80.

# FACTS ABOUT HONEY



THE editorial on the "Food Value of Honey," on page 404, of the December American Bee Journal was so highly appreciated, and so many enquiries came for a reproduction of it in pamphlet form that there was prepared a 16-page booklet for advertising honey containing this and other matter of importance which the consumers ought to know. Size of booklet 5 3-4x9 inches. Weight a scant ounce.

"Facts about Honey" contains the following information illustrated with 17 splendid half tones: What honey is and where gathered; Principal kinds of honey; Different flavors and colors; How produced; Bee-trees and bee hunting; Bees in boxes and gums; The new way of honey production; Movable-frame hives and sections; Comb honey; Comb foundation; Why the bees build straight in the section; Chunk honey; Extracted honey, the honey extractor and manner of extracting; Purity of honey; Granulation of honey, how to melt it; Food value of honey; Is honey a luxury; Honey as health food; Uses in cook-

ing; Fifty recipes for use of honey.

On the last page room enough is left to print the beekeeper's name and the prices he asks for his honey. Or the address may be printed on the front cover page. At the bottom of the last page there is also room to address the booklet to the consumer, after folding it so that no envelope is needed. A gummed "Eat Honey" label or wire clasp is sufficient to hold it together for mailing.

We will furnish these pamphlets at unprecedented low prices, as follows:

Single copy as sample, free.		500 copies, postage extra	\$ 5.00
Less than 30 copies, postpaid, each \$ .03		1000 " " "	9.00
30 " " "	.75	2000 " " "	17.00
50 copies, postage extra	.75	5000 " " "	40.00
100 " " "	1.25	10,000 " " "	75.00

For parcel-post shipment, the weight is about 6 pounds per 100 copies.

Printing name and address of producer, with brief price-list of honey on either front or back page: 500 or less, \$1.00; 1000 or more, \$1.50 per thousand.

The pamphlet contains no advertising or address of any kind and is distinctly a positive, unbiased and clear explanation of the usefulness of honey, intended for a reply to the numerous questions usually asked by the uninformed consumer. Send your orders to

**American Bee Journal, - - - - - Hamilton, Illinois.**









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## BEE-KEEPERS:—

We manufacture Millions of **Sections** every year that are as good as the best. The **CHEAPEST** for the Quality; **BEST** for the Price. If you buy them once, you will buy again.

We also manufacture **Hives, Brood-Frames, Section-Holders and Shipping-Cases.**

Our Catalog is free for the asking.

**Marshfield Mfg. Co.,**

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## Italian Queens—Three-Banded



We have bred queens over 25 years, and have hundreds of customers who will testify to the quality of our queens. We haven't any disease among our bees and never have had. Our prices are as follows: Untested queens, \$1.00; \$10 per dozen. Tested, \$1.25 each; \$12 per dozen. Select tested, \$2.00 each; \$20 per dozen. Breeding queens, \$5.00 each. Special prices on large orders. Our customers must be pleased. Safe arrival guaranteed. Send check with orders to

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Prices on nuclei on request.

## QUINN'S QUEENS OF QUALITY

### ARE PEERLESS—"THERE'S A REASON"

They are thoroughbred, pedigreed, three-banded Italians and Grey Caucasians. "Mendelian" bred; good qualities are accentuated. Special drones from superior mothers; results are obvious.

PRICES—Untested, April, May and June, \$1.50 each. After June 30, \$1.00 each. Tested queens of each race, \$2.00 each.

For Italians, address Ft. Myers, Fla.; for Caucasians, address Houston Heights, Tex.

**CHARLES W. QUINN**  
609 W. 17th Ave., HOUSTON HEIGHTS, TEXAS

# START THE SEASON RIGHT

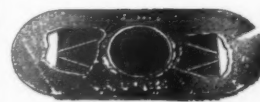
By using **Dittmer Foundation** the bees like it for it's made to just suit them, and is just like the Natural Comb they make themselves.

Send for prices on having your Beeswax made into Comb Foundation, which includes all freight charges being paid.

**All other Supplies in stock**

**Gus Dittmer Company, Augusta, Wisconsin**

## PORTER BEE ESCAPE SAVES HONEY TIME MONEY



For sale by all dealers.  
If no dealer, write factory  
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Please mention Am. Bee Journal when writing

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Best Sections, Best Shipping Cases  
Best of all Supplies

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Will and must please you. Three-band Italians only. Prices from May 1st to July 1st as follows: Queens, untested, 75c each; \$4.00 for six or \$7.50 per dozen. Tested \$1.00 each; \$5.70 for six, or \$10.75 per dozen. Select tested, \$2.50 each. Breeding queens, \$5.00 each. One pound package bees, \$1.25; 25 packages, \$1.00 each; 2-pound package, \$2.25 each; 25 packages, \$2.00 each; 3-pound package, \$3.25 each; 25 packages, \$2.75 each.

Special prices on larger quantities booked early. Twenty years experience. No disease. 75 percent of untested queens guaranteed purely mated. Safe arrival and reasonable satisfaction guaranteed.

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## WHEN ORDERING SUPPLIES

Remember we carry a full stock and sell at the lowest catalog price. Two lines of rail road—Maine Central and G and Trunk. Prompt service and no trucking bills.

**THE A. I. ROOT CO., Mechanic Falls, Me.**  
J. B. MASON, Manager



## **CYPRESS BY TEST Substitutes by Talk THE PROOF?—2 LETTERS FROM BEEMEN:**



"Our correspondent makes serious complaints against.....and MAKES A PLEA FOR CYPRESS as a BEEHIVE MATERIAL. We hope you will look into this matter," (Etc.)—and here's another:

"Mr. ———, of ———, just came into the office. He informs us that they tried a car of CYPRESS LUMBER last year for the first time, and are so well pleased with it that they are ORDERING ANOTHER CAR for use in making HIVE BOTTOMS."

Is there value to you in an endurance test of 45 years in greenhouse sash? It is reported to us that sash made of heart Cypress by a prominent greenhouse contractor in Chicago, and placed in position in a greenhouse at Des Plaines, Ill., in 1868 are STILL DOING SERVICE.

IT WILL SERVE YOU AS WELL and save you the nuisance and expense of repairs and replacements.

The argument backed by such facts cannot be answered by mere talk. Ask the manufacturer or contractor who wants to give you a "substitute" for Cypress to cite you to an endurance test of 30 or 45 years to the credit of the so-called "substitute."

That is no more than a fair precaution on your part—good ordinary business sense.

WRITE US FOR VOL. I. OF THE FAMOUS CYPRESS POCKET LIBRARY WITH FULL U. S. GOVERNMENT REPORT ON "THE WOOD ETERNAL."

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For quick service address nearest office.

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### **DO YOU WANT Your Bee Supplies Shipped Promptly?**

We carry four to six carloads of the finest BEEWARE on hand at all times, and can fill your orders without delay. BEE-HIVES, SECTIONS, SHIPPING CASES, TIN CANS, and all other Bee Supplies, also

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by return freight, mail or express. We have forty years' experience and thousands of satisfied customers. Are you one of them?

DADANT & SONS, Hamilton, Illinois.

Dear Sirs:—The box of foundation arrived a few days ago in fine condition. I have kept bees for over thirty years, and have purchased foundation from many firms, and must say that your foundation is the nicest that I have ever used, and I wish to thank you for the prompt shipment and large amount of wax you secured for me.

Alburg, Vt., May 3, 1916.

Yours truly,

A. W. DARBY.

**DADANT & SONS,  
HAMILTON, ILLINOIS.**